HREE MATHEMATICS

MODULE 1

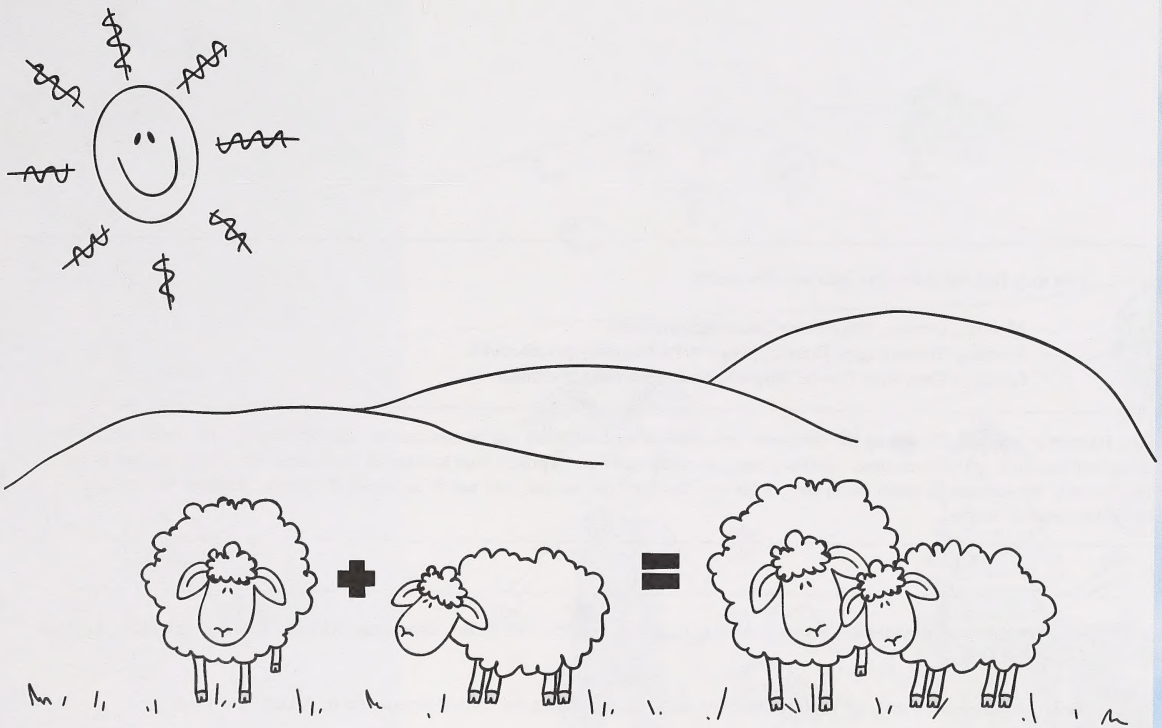
ADDITION AND SUBTRACTION

Learning Technologies Branch

Alberta LEARNING

GRADE THREE MATHEMATICS: MODULE 1

ADDITION AND SUBTRACTION



Learning Technologies Branch

Alberta LEARNING

Grade Three Mathematics
Module 1: Addition and Subtraction
Student Module Booklet
Learning Technologies Branch
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This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

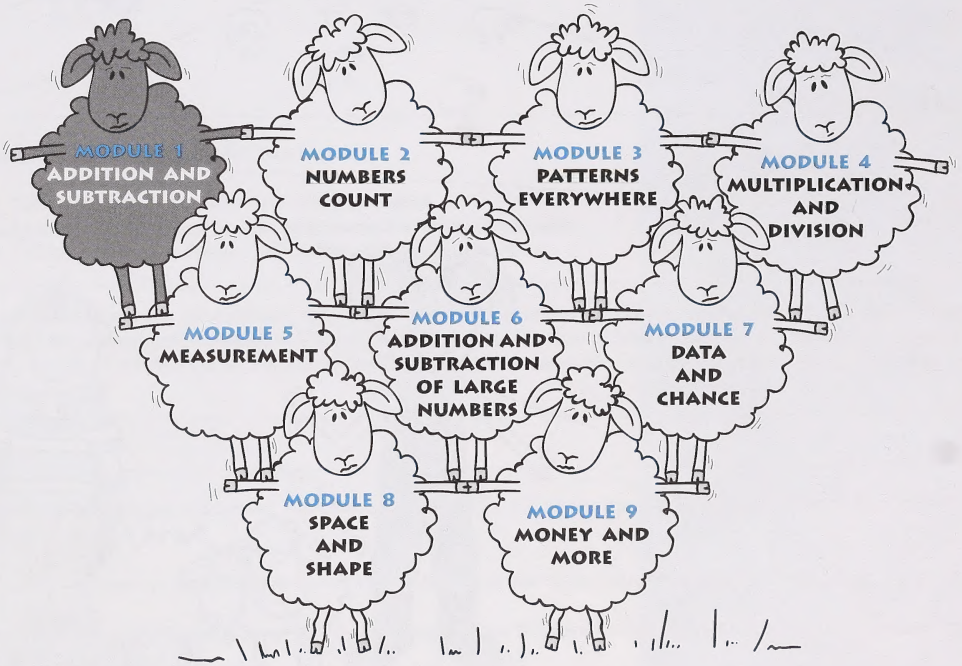
- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

WELCOME
TO GRADE THREE MATHEMATICS

You may not realize it, but you use mathematics many times every day. You are using math when you count the money in your pocket, find a date on the calendar, or sort your toys. As you work through Grade Three Mathematics you will learn how to do many new things. You will also learn how math can be useful in solving everyday problems.

Each unit in the Grade Three Mathematics course is called a **module**. Read the titles of the modules below to find out what you will learn about this year.



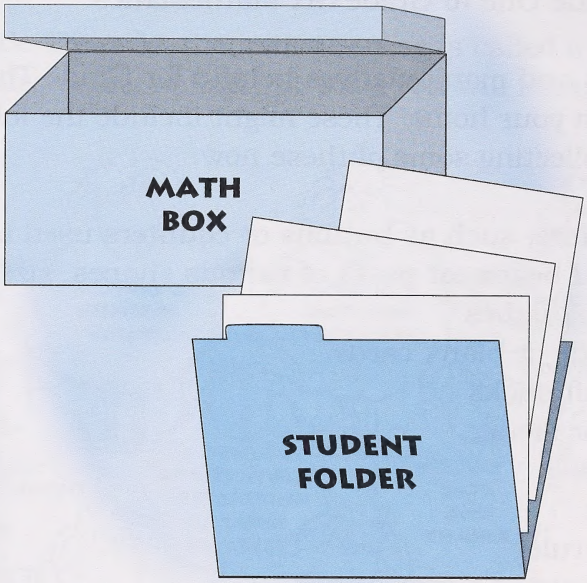
MATERIALS YOU WILL NEED

For Grade Three Mathematics, you will need to purchase base ten blocks and a calculator. (TI-108 is recommended.) These are required materials throughout Grade One to Grade Six Mathematics.

Other materials and manipulatives helpful for Grade Three Mathematics may be found in your home. These might include the following. You may want to start collecting some of these now.

- small counters, such as buttons or counters used in games
- beads, dried beans, or pasta of various shapes, sizes, and colours (1000)
- dice or blank cubes
- playing cards or blank cards
- wooden craft sticks
- catalogue or fliers
- coins and bills
- metre stick
- centimetre ruler
- metric measuring cups
- coloured blocks
- toothpicks

You will also need a box to keep your materials in and a folder to hold your papers.



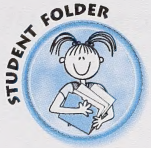
The folder will be called your **Student Folder**. The box will be called your **Math Box**. Write the names on the outside as shown.

At the end of the day, put your papers in the Student Folder and your materials back in the Math Box.

ICONS

Icons are signs or pictures that stand for an idea. You will see the icons below in your Student Module Booklet. Each icon tells you to do something.

This icon tells you to put something in or take something out of your Math Box.



This icon tells you to put something in or take something out of your Student Folder.

This icon tells you to go to the Assignment Booklet.

This icon tells you that you are about to do an extension activity for fun or extra practice.

This icon tells you about Internet sites, computer games, or computer activities for fun or extra practice.

This icon tells you to use the Answer Key to correct your own work. You will begin doing self-correcting activities in Module 6.

CONTENTS

ADDITION AND SUBTRACTION

You use addition and subtraction often when you solve everyday problems. When you put two groups of toys together and figure out how many you have altogether, you are using adding skills. If you give some of your cookies to a friend, you find out how many you have left by using your subtracting skills.

In this module, you will practise addition and subtraction. You will work with addition and subtraction facts and solve problems.

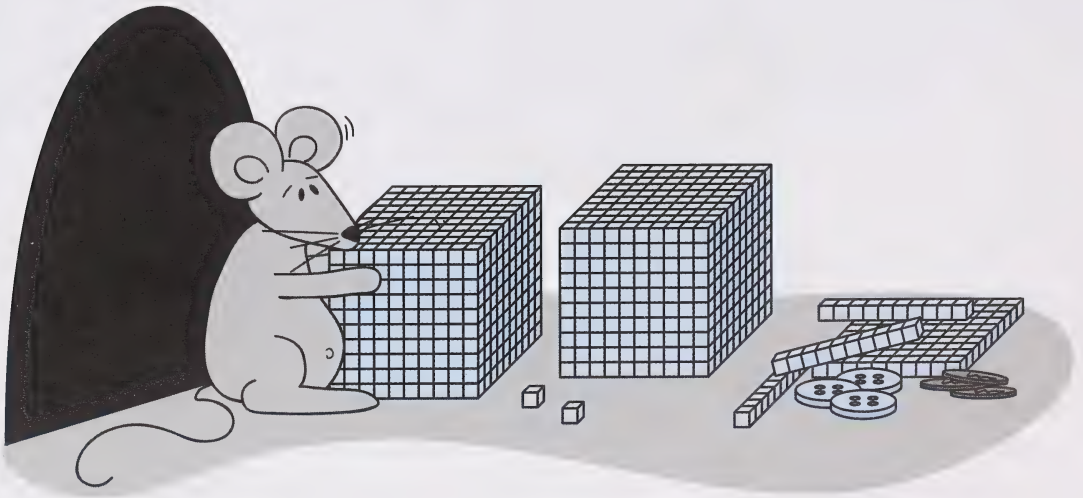
MATERIALS FOR MODULE 1

Your student will be working on addition and subtraction to 100 in this module. Provide at least two groups of manipulatives, such as pennies, or other small counters, that have approximately 100 objects each.

The commercial base ten kit allows students to visualize the units more clearly.

For Module 1, you will need the following items. Small plastic bags or plastic containers are useful to hold your materials.

- pennies
- small counters, such as buttons, beads, beans, or pasta
- catalogues or fliers
- base ten blocks
- calculator (TI-108)



DAY 1: COMBINING GROUPS

Welcome to the first day of Grade Three Mathematics.

In today's lessons, you will review some of the things you learned about addition in grade two. You will also meet two cartoon characters that you will see throughout the Grade Three Mathematics course.

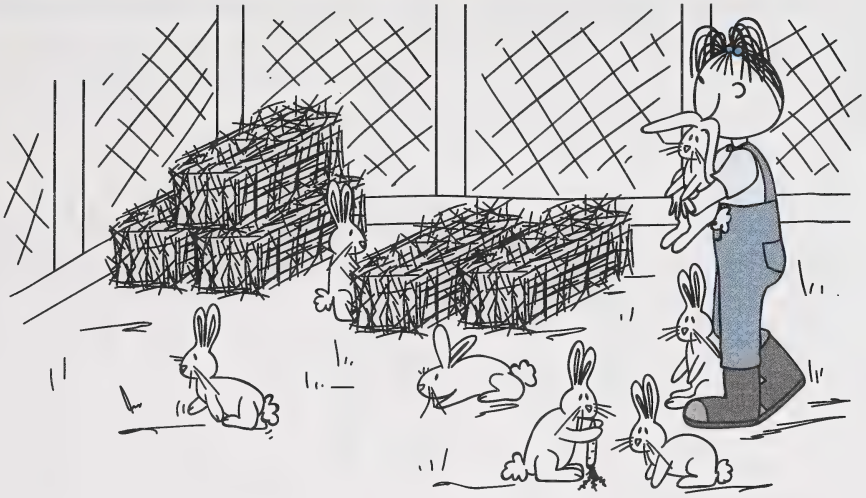
Are you ready to begin?

LESSON 1

An important part of the mathematics program in a classroom is the interaction between students as they discuss how to solve a problem. These cartoon students as well as other characters are used throughout the program to give alternative ways of solving problems. They may also give tips and reminders or pose problems for your student.

Now it's time to meet Sarah and Luke. Sometimes Sarah and Luke will give you math tips, and sometimes you will help them solve math problems.

Sarah and Luke are in grade three, like you. They are cousins. Sarah lives on a farm and loves animals. Luke lives in the city and enjoys sports. Luke has trouble walking, so he uses a wheelchair to get around.



Sarah raises rabbits and sells them to a pet store in a nearby town. She plans to sell all of her young rabbits. She knows that she has 6 young bunnies in one pen and 7 in another pen.

How can Sarah figure out how many rabbits she can sell?

Sarah learned about math **operations** in grade two. She knows that the operations of addition and subtraction can be used to solve problems. She can find out the total number of rabbits by adding the two groups.

Tell your home instructor some things you know about adding.

Remind your student that addition and subtraction are math operations or processes. Multiplication and division are also math operations that your student will learn in grade three.

Encourage your student to tell you about addition. Addition is used to combine or join two or more groups.

You probably remember that addition is used when you combine or put groups together. The number you get when you add two or more numbers together is the **sum**. You can help Sarah solve her problem by combining the two groups. Use counters to represent the rabbits.

Take a handful of small objects from your math box. Count out 6 objects in one pile and 7 objects in another pile. Push those two piles together.

1. What math operation did you just do? _____

2. Sarah knows that it is a good idea to write a number sentence or **equation** to help solve the problem. Here are the equations she started.

   $6 + 7 =$ _____ or $\begin{array}{r} 6 \\ +\ 7 \\ \hline \end{array}$

   Now help Sarah solve the equations to find out how many counters there are altogether.

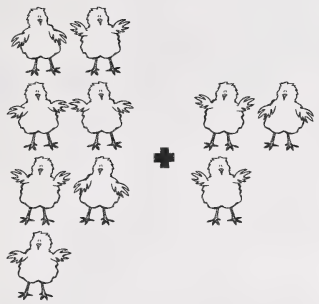
3. How many rabbits will Sarah have to sell?

   Sarah will have _____ rabbits to sell.

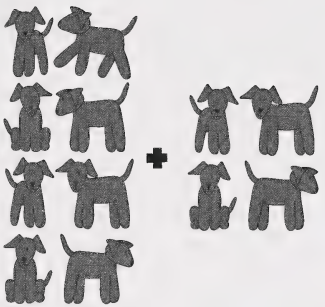
You may have to review the fact that an equation or number sentence is used to show mathematical operations. Equations contain numbers and symbols, such as $4 + 6 = 10$ and $14 - 7 = 7$. If necessary, write the symbols on a chalkboard or paper, and ask your student what they mean.

4. Write a number sentence for each of the pictures below.

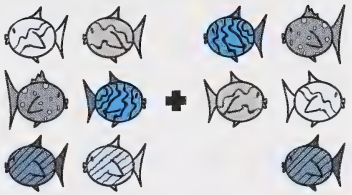
a. _____



b. _____



c. _____



5. Draw a picture for each number sentence.

a. $5 + 4 =$ _____

b.
$$\begin{array}{r} 3 \\ +\ 9 \\ \hline \end{array}$$

Be sure your student understands all the symbols and numbers for each equation. The equations may be written vertically (up and down) or horizontally (across).

Sometimes, you need to combine more than two numbers or groups to find a total.

6. Last year, Sarah had three pens of rabbits. She had 6 in one pen, 5 in another pen, and 3 in the last pen. How many were there in all?

   Sarah wrote an equation like this to solve the problem.

   $6 + 5 + 3 =$ _____

   Use counters to find the answer for Sarah.

   Sarah had _____ rabbits in all.

7. Do these equations using your counters.

   a. $4 + 3 + 6 =$ _____ b. $7 + 5 + 4 =$ _____

   c. $6 + 5 + 2 + 3 =$ _____

LESSON 2

How do you know when to add and when to subtract? Tell your home instructor.

Your student should explain that when groups are being joined, addition is used. When groups are separated or taken away, subtraction is used.

In a number sentence, the symbols + and – tell you what to do.

This symbol tells you to add.

$$8+5=13$$

This symbol tells you to subtract.

$$13-5=8$$

In a word problem, words like *more*, *altogether*, *sum*, *join*, and *in all* tell you to add.

You or your student may be able to think of other words that tell you to add.

Luke has 3 trophies for wheelchair racing. Luke also has 8 ribbons that he won in other sports. How many prizes does he have in all?

Do you add or subtract to find out how many prizes Luke has?_____

LESSON 3

Most students learn to recall the addition and subtraction facts to 18 by memory by the end of grade two. If your student can't recall these facts, provide extra practice. Check the Extension Activities on Day 6 for ideas.

Allow your student to use counters or any other preferred method.

1. You solved some addition problems in grade two. Solve the number sentences below to review your work from grade two.

   a. $3 + 4 =$ _____ b. $5 + 2 =$ _____ c. $7 + 1 =$ _____

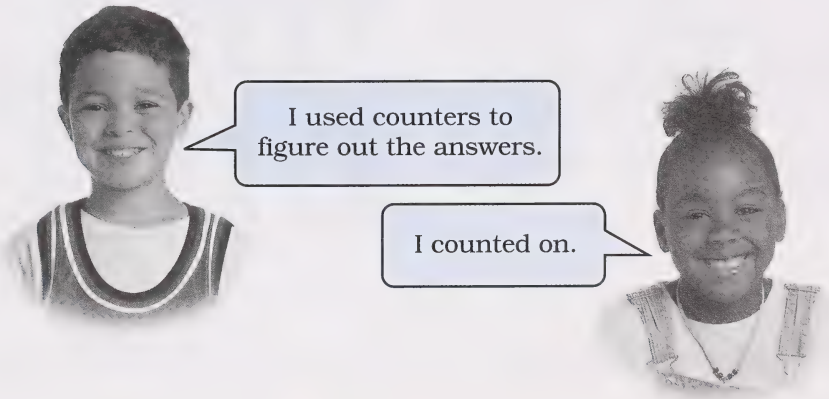
2. Now try solving the problems below. Think of a way to solve the number sentences if you don't remember the answers.

   a. $7 + 8 =$ _____ b. $9 + 9 =$ _____ c. $6 + 9 =$ _____

   d. $4 + 5 + 1 =$ _____ e. $3 + 6 + 5 =$ _____ f. $6 + 7 =$ _____

It is important that your student develops strategies for solving addition and subtraction problems. The next lessons will guide your student through a review of several different strategies.

How did you solve these equations? Tell your home instructor.



DAY 2: USE YOUR HEAD!

Have you ever had to solve a problem when you didn't have a pencil and paper or counters handy? Sometimes, you need to solve problems mentally or in your head.

Today's lessons will teach you some tricks that can help you remember addition facts and solve problems quickly in your mind.

LESSON 1

Your student may mention memorizing answers, counting on, or other strategies.

On Day 1, you solved addition questions by using counters and drawing pictures. Both of these methods take a long time. Can you think of some quicker ways to solve math questions? Tell your home instructor.

Have you ever tried **counting on** to solve a problem? Counting on is the practice of starting from a number and counting forward.

Take about 18 pennies from your Math Box.

Turn to the Cut-Out Learning Aids section in the Appendix. Remove the page called "Number Cards to 20." Cut out the number cards. Find a cup.

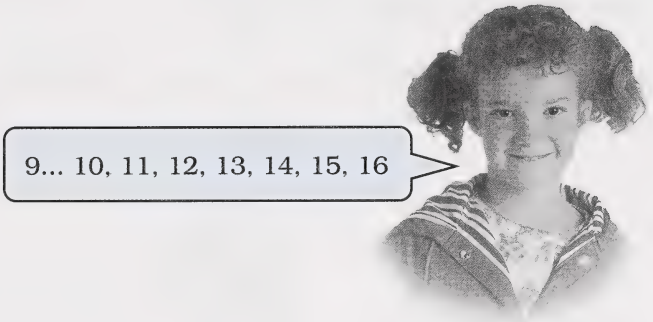
Read the following problem. Then read the instructions to solve it.

Sarah knows she has 9 pennies in her piggy bank. She found 7 more. How many does she have in all?

Act out the problem. Put 9 pennies in the cup. Put the number card 9 by the cup. Count out 7 more pennies.

You know there are 9 pennies in the cup. You don't have to count them again. Say 9, and then count on 7 more as you put each penny in the cup.

9

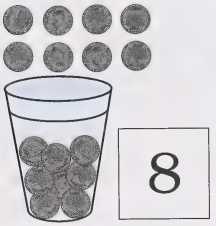


1. Sarah has _____ pennies.

DAY 2

If necessary, tell the student that addends are numbers added to get a sum. The student should remember that the answer of an equation remains the same even though the order of the addends is changed. This strategy can be used to make counting on more efficient and faster.

2. Solve each of the equations below using your pennies, cards, and cup to count on.



a. $8 + 8 =$ _____

b. $6 + 4 =$ _____

c. $9 + 5 =$ _____

d. $7 + 8 =$ _____

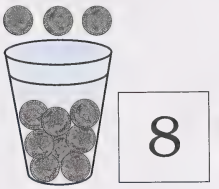
e. $2 + 9 =$ _____

f. $9 + 2 =$ _____

What did you notice about the last two equations? Is the answer the same for both? Tell your home instructor.

You may have started a poster to list math words that your student will need to know. Write "addend" on the poster, and have your student supply a definition. Keep this poster in a visible location and add to it as necessary.

Did you remember that you can switch **addends** around and the answer remains the same? This trick can help you when you are counting on.



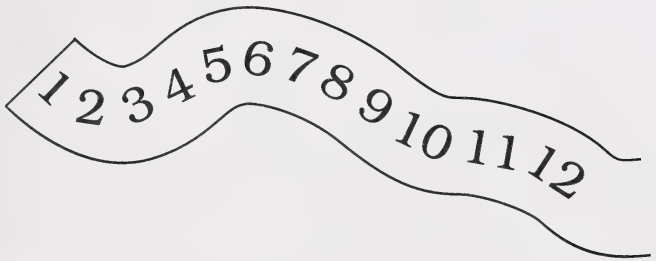
The equation is 3+8=____. I know that 3+8 is the same as 8+3, so I start with the bigger number which is 8. Then I count 3 more: 8 . . . 9, 10, 11. The answer is 11.

3. Use your pennies, cards, and cup to solve the problems below. Remember to put the bigger number of pennies in the cup. Then count on from there.

a. 5 + 9 = _____ b. 8 + 4 = _____

c. 5 + 7 = _____ d. 7 + 4 = _____

As you get better at counting on, you will find that you do not need the pennies. You can count on in your mind.



It might help you to visualize or imagine the numbers written in order as you count on to solve the following equation.

9 + 3 = _____

1 2 3 4 5 6 7 8 **9** 10 11 12 13 14 15 16 17 18 19 20

Students will develop different methods of keeping track of how many they are counting on. The goal is to be able to count on mentally, but allow the use of counters or other strategies if they are necessary. It is a good idea to have your student write the numbers to 100 on adding machine tape or any narrow strip of paper. This can be posted near your student's learning area.

13 14 15 16 17 18

Some students use their fingers or tiny dots to help them count on. With practice, you will find that you can count on in your mind.

4. Try to do these equations by counting on in your mind.

a. $7 + 3 =$ _____ b. $4 + 9 =$ _____

c. $8 + 2 =$ _____ d. $5 + 6 =$ _____

e. $4 + 5 =$ _____ f. $3 + 9 =$ _____

g. $6 + 2 =$ _____ h. $7 + 9 =$ _____

You can also use this strategy for adding more than two numbers. Say the biggest number. Then count on for each of the other numbers.

$2 + 4 + 8 =$ _____

Say 8. Then count on 4, and then 2 more.

8, 9, 10, 11, 12, 13, 14

LESSON 2

You know that the number 10 is very important to the number system. Remembering which numbers add up to 10 can help you add numbers quickly.

Ten is the basis of the number system. If students can recall the addends that equal ten, it helps them estimate and add larger numbers.

Turn to the Cut-Out Learning Aids section in the Appendix. Find the page called "Tens Frame," and cut out the frame.

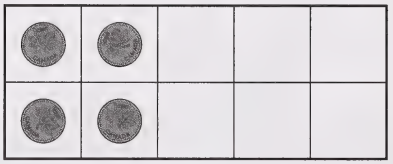
Luke wants to buy some candy that costs 10 pennies. He has 7 pennies in his pocket. How many more pennies does he need?

Put 7 pennies in the tens frame, one in each space.

You can tell at a glance that there are 3 spaces left. So, you know that 7 + 3 = 10.

Luke will need 3 more pennies to buy the candy.

Try some more combinations using your tens frame. The first one is started for you.



1. 4 + _____ = 10
2. 8 + _____ = 10
3. 3 + _____ = 10
4. 5 + _____ = 10
5. 10 + _____ = 10
6. 2 + _____ = 10
7. 9 + _____ = 10
8. 1 + _____ = 10

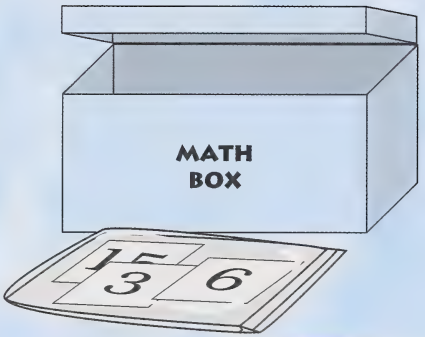
What did you notice about the last two number sentences? Tell your home instructor.

Your student should notice that the addends are the same, only the order is reversed.

Knowing that the addends can change places makes it easier to remember these facts.

Now, try doing some combinations for ten in your head. Try to picture the tens frame in your mind to help you find the answer. As your home instructor says a number, tell how many more you would need to make ten.

Say a number between one and ten, and have your student tell you what number would be added to make ten. For example, if you say four, your student should say six. If you say one, your student should say nine.



Put your tens frame and number cards into your Math Box. It is a good idea to put the number cards into a small bag or container.

DAY 3: DOUBLE IT!

Have you ever heard someone say "I'll have to double this recipe?" Doubling amounts or numbers is a useful skill in everyday life.

In today's lessons, you will practise adding doubles, doubles + one, and doubles + two. You will also work with tens to help you add larger numbers.

LESSON 1

Luke is making some pancakes for his basketball team. He knows that he will have to double the recipe to have enough pancakes for everyone.

When a number is doubled, it means that the number is added to itself. For example, $1+1$ is a double, as is $2+2$. You will probably find that double facts are easy to remember.

1. Write the answers for the doubles below. Use counters if you need to.

a. $1+1=$_____ b. $2+2=$_____ c. $3+3=$_____

d. $4+4=$_____ e. $5+5=$_____ f. $6+6=$_____

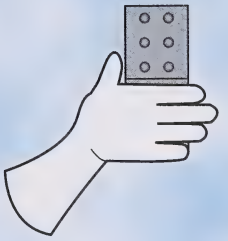
g. $7+7=$_____ h. $8+8=$_____ i. $9+9=$_____

You may have noticed that the answers form a pattern. Tell your home instructor the pattern you see.

Most students find the facts for the double numbers easy to remember. Being able to double numbers is a useful skill and will be used throughout the grades and in real life.

When the doubles are written in order, the answers form the same pattern as counting by 2s.

DAY 3



Hold up each domino covering the bottom half with your hand. Ask your student to tell you how many dots are on the whole domino.

This activity helps your student visualize the doubles. Practise several times. Your student should start recognizing the dot patterns without counting. You may notice the student counting on from the visible half. For example, if the domino shows 6 and 6, the student may say 7, 8, 9, 10, 11, 12.

Turn to the Cut-Out Learning Aids section of the Appendix. Remove the page called "Domino Doubles," and cut out the dominoes.

These dominoes can help you visualize the amounts when you add doubles. Your home instructor will hold up the domino with the bottom section covered. Try to imagine the dots that would be on the bottom. Remember, they are all doubles. Tell your home instructor how many dots there are in total on each domino.

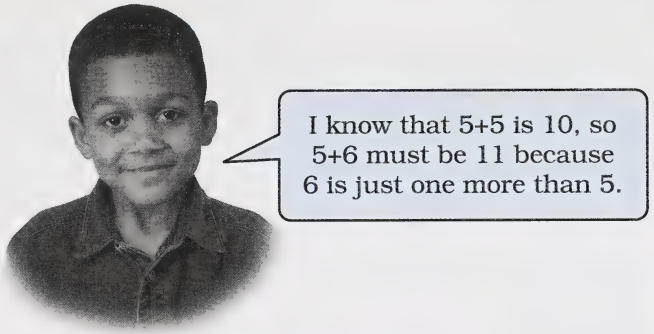
Are you ready to help Luke with his recipe?

2. Double each of the ingredients below to help Luke make the pancakes for his basketball team.

Original Recipe	**Doubled Recipe**
2 eggs	a. _____ eggs
250 mL pancake mix	b. _____ mL pancake mix
200 mL water	c. _____ mL water
250 mL bananas	d. _____ mL bananas

LESSON 2

If you can remember the facts for the doubles, you can use them to help you remember doubles +1 and doubles +2.



Use the doubles facts to help you find the answers to these doubles +1 and doubles +2 equations.

1. 3 + 3 = _____ so 3 + 4 = _____

2. 6 + 6 = _____ so 6 + 7 = _____

3. 9 + 9 = _____ so 9 + 10 = _____

4. 7 + 7 = _____ so 7 + 9 = _____

5. 8 + 8 = _____ so 8 + 10 = _____

This activity asks your student to calculate answers for doubles +2 questions. For example, if 3 + 3 is 6, then 3 + 5 must be 8.

LESSON 3

On Day 2, you practised making tens by using a tens frame and thinking about how many more pennies were needed to make 10. Today, you will practise making tens to help you add larger numbers. This is another strategy that can help you remember the addition facts.

Find your tens frame in your Math Box. Take out some pennies or other small counters.

Put a counter in each square. Now put 4 counters below your tens frame.

You have 1 ten and 4 ones.

1. How many counters do you have? _____

Your student should realize that one ten and four ones is the same as 14. This concept was introduced in grade one.

2. Use your counters and tens frame to show each of the numbers below.

   a. 1 ten + 8 or _____

   b. 1 ten + 5 or _____

   c. 1 ten + 9 or _____

3. Can you do these equations easily now without using your counters?

   a. 10 + 2 = _____ b. 10 + 7 = _____ c. 3 + 10 = _____

Now use what you know about making tens to add a number to 9.

Try to solve the equation 9 + 7 = _____. Put 9 counters in your tens frame.

Put 7 more counters under the tens frame. If you make a ten, it is easier to add, so put one of your counters on the extra space on the tens frame. Now, it's easy to see that you have 10 + 6 = 16 or 9 + 7 = 16.

The basic understanding of tens and ones is very important. When students regroup or borrow and carry, they are using this skill. Students need to be able to visualize the tens and ones and realize that each can be manipulated.

Making Tens

9+1

6+4

5+5

8+2

7+3

4. Solve these equations by putting 9 counters on your tens frame and then putting the rest of the counters below. Remember to move a counter, and fill the tens frame to make it easier to count.

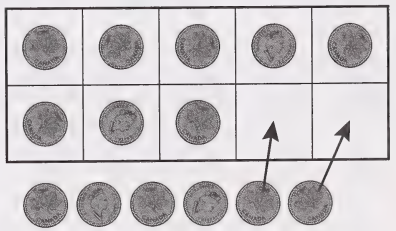
   a. $9+5=$_____ b. $9+9=$_____ c. $6+9=$_____

5. Now try it in your head. Picture the tens frame in your mind, and think about moving 1 counter to fill up the frame.

   a. $9+3=$_____ b. $8+9=$_____ c. $9+2=$_____

You can use the same trick when you are adding with 8, but leave 2 spaces blank.

Try to solve $8+6=$_____ using the tens frame.



This time move two counters. Now, you have $10+4=14$ or $8+6=14$.

LESSON 4

One of the goals in this Grade Three Mathematics course is to **recall** math facts. By the end of the year, you should be able to remember the addition and subtraction facts to 18. You have learned some different ways to help you add numbers quickly. Use the strategies that work best for you. You may also use counters, the tens frame, or the domino doubles to help you. Work toward remembering the facts using the tricks you have practised.

Discuss how doing timed tests can help your student practise the math facts.

One way to practise these facts is to do timed practice pages like the one you see on the next page. This first timed exercise is to practise addition number facts.

On timed practice pages, try to finish as many equations as you can in 2 minutes. Do not be discouraged if you can't do all 20 questions in 2 minutes. You will get better as you practise more.

If you are ready to begin the timed exercise, ask your home instructor to time you for 2 minutes. Write how many you completed. Ask your home instructor to mark the questions and to write how many were correct.

Your student may require additional practice with flashcards or games. See the Extension Activity on Day 6 for ideas.

Use a stop watch or a clock with a second hand to time your student for two minutes. When you say stop, the student should not complete any more questions. Have the student write how many questions were completed in two minutes. Check the answers. Then write how many of the questions were correct.

TIMED EXERCISE: 2 MINUTES

3 + 8	7 + 5	5 + 4	4 + 6
6 + 5	8 + 2	1 + 8	9 + 3

5 + 6 = _____	8 + 8 = _____	4 + 6 = _____	2 + 7 = _____
8 + 5 = _____	7 + 6 = _____	3 + 6 = _____	7 + 7 = _____
9 + 1 = _____	4 + 7 = _____	9 + 9 = _____	7 + 3 = _____

Now it's time to go to Assignment Booklet 1A.

Number completed	
Number correct	

DAY 4: PROBLEMS, PROBLEMS!

Do you know how much money you need to save each week to buy something you want? Do you know how many different clothes combinations you can make with your new t-shirt? Which bead should come next to make a pattern on a necklace you are making? Every day brings new problems to solve.

As you grow up, there are many problems you will need to solve. In today's activities, you will learn how to use four steps to help you become a better problem solver.

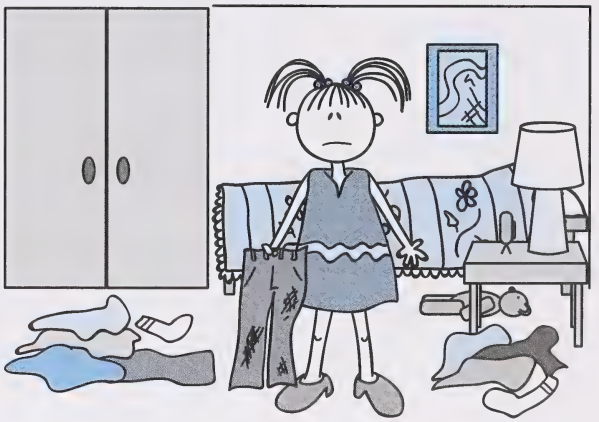
LESSON 1

In today's lesson, your student will be introduced to a four-step problem-solving process. This process will be used throughout the course.

If necessary, remind your student of a problem-solving time. The problem does not have to be a mathematical one, just something that required a solution.

Maybe you have already solved problems today! When something goes wrong and you need to figure out what to do, you are solving a problem. Any time you have to find an answer to a question, you are a problem solver.

Tell your home instructor about a problem you had recently. How did you solve it?

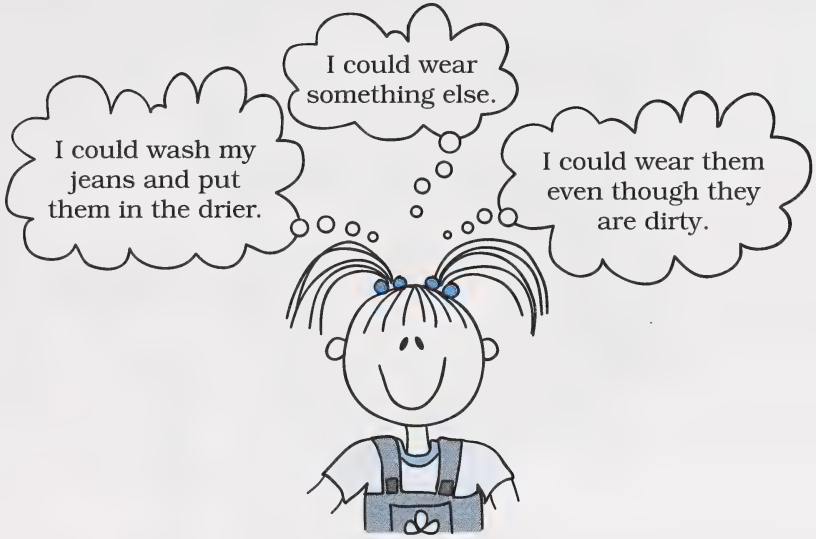


Sarah and her family are going to town to the fair. Sarah wants to wear her new jeans, but they are dirty. Sarah has a problem!

What is Sarah's problem?

_____

The next thing Sarah needs to do is to think of some ways she could solve this problem.



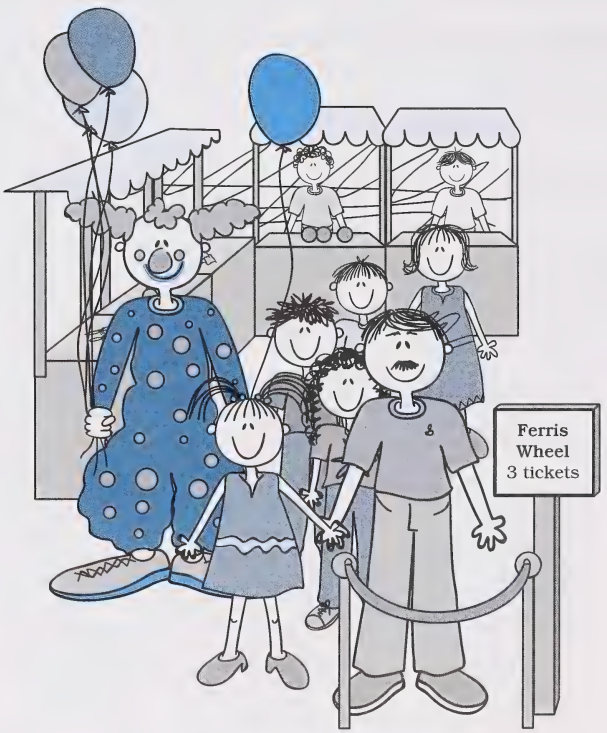
Now Sarah needs to make a plan. She asks her Mom if there is time to wash and dry her jeans. Her mom tells her there will be time if she hurries.

Sarah quickly carries out her plan and washes the jeans. She is ready just in time!

Tell your student that there are often several different ways to solve problems in real life and in mathematics. Different people solve problems in different ways. There may be more than one right method.

Now, it is your turn to solve the following problem. When you are solving problems, you can use the same process Sarah used.

1.



Sarah arrived at the fair. She was waiting in line at the Ferris wheel with her dad. Her dad said, "It looks like a long wait. I'll pay for our tickets if you can figure out how long we will wait before we get on the ride."

The four steps that follow can help you.

STEP 1: UNDERSTAND THE PROBLEM.

The first thing you need to do is understand what you need to find out.

a. What is the problem Sarah has to solve?

Ask your student to restate the question in his or her own words.

STEP 2: MAKE A PLAN.

Now Sarah has to think of a plan to solve the problem.

b. How can Sarah solve the problem?

You may need to help your student suggest ways to solve the problem since several steps are involved. Your student may think of a different way to solve the problem.

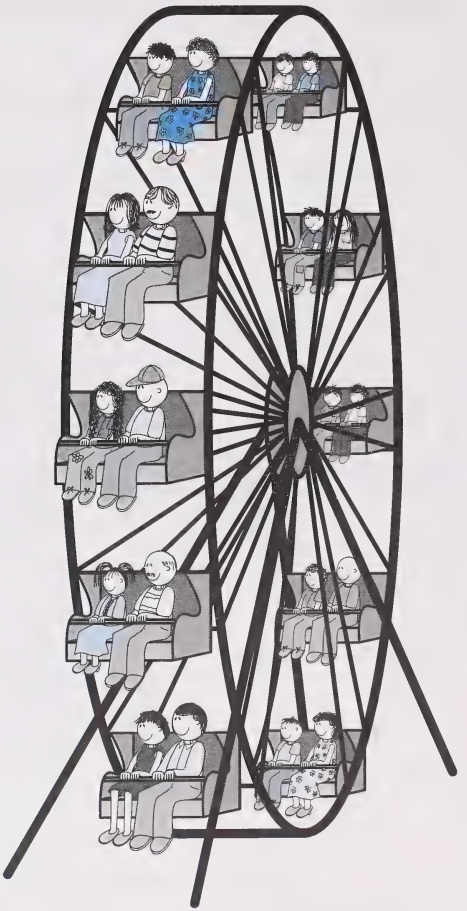
STEP 3: TRY THE PLAN.

Next, Sarah needs to follow her plan and see if it works. Sometimes a plan doesn't work, and you need to try again.

Sarah's plan was to count how many people could go on the Ferris wheel at one time. She also needed to know how long each ride lasted, and how many people were ahead of them in line.

Sarah counted and found out that 20 people could go on the ride each time. Using her watch, she found out that each ride took 5 minutes. She also counted 40 people in front of them.

Sarah knew that $20 + 20$ was 40. That meant that there would be two groups ahead of them on the Ferris wheel. Since each ride took about 5 minutes, and she knew $5 + 5$ was 10, she thought that it would be about 10 minutes before they would get on the ride.

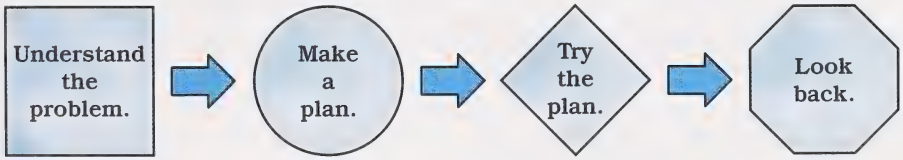


STEP 4: LOOK BACK.

Before Sarah told her dad the answer, she wanted to be sure it was right. She thought back to the question and knew her dad wanted to know the amount of time it would take. She thought 10 minutes was a reasonable answer.

Sarah told her dad the answer. Since she was right, her dad paid for their tickets.

These four steps can help you solve many problems.



Use the four steps to solve the following problem.

2. Sarah and her family went to visit an animal display at the fair. In one pen there were 8 young goats. In the next pen, there were 7 nanny goats. How many goats were there in all?

Understand the problem.

STEP 1: UNDERSTAND THE PROBLEM.

a. What do you need to find out? _____

_____

STEP 2: MAKE A PLAN.

Think about the problem. Do you need to add or subtract? Is there any missing information?

b. How will you solve the problem?

_____

STEP 3: TRY THE PLAN.

Work out your answer. You often need to write a number sentence and solve it.

c. Write an equation for the problem. Find the answer.

_____

d. Write your answer in a complete sentence.

_____

Your student should write a complete sentence to answer problem-solving questions. Be sure the student understands what a complete sentence is.

Your student should explain that the answer is reasonable.

Look back.

STEP 4: LOOK BACK.

Look at the answer. Does the answer make sense? Tell your home instructor.

LESSON 2

Can you make up your own problem-solving questions?

When you are writing problem-solving questions, you need to remember to

- write in complete sentences
- give all the necessary information
- ask a question

Make up your own problem about Sarah's trip to the fair. Ask your home instructor to solve it.

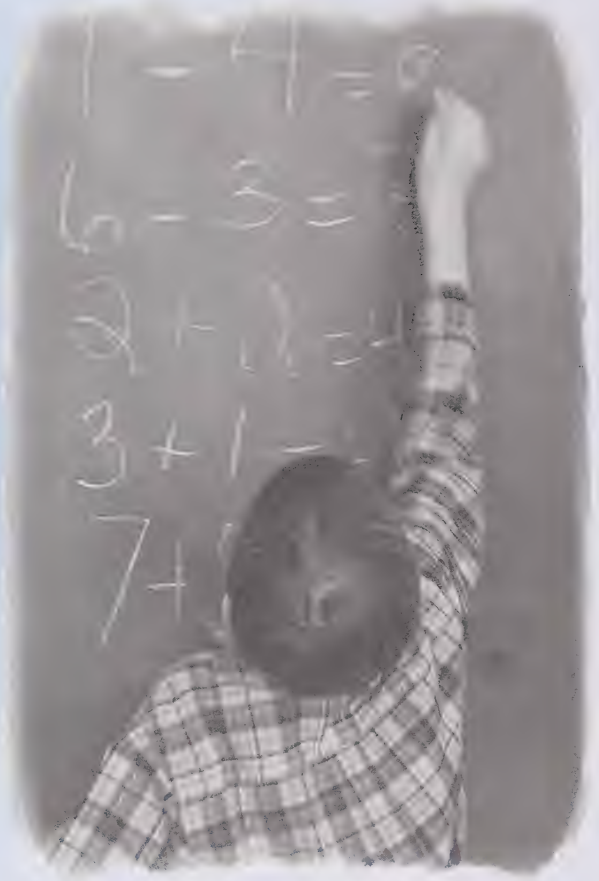
If the student has not made up problems in the past, you may need to make suggestions about possible situations. Check to see that all necessary information is included.

Go to Assignment Booklet 1A.

DAY 5: SEPARATING AND COMPARING GROUPS

For the past few days, you have practised different ways of adding or combining groups. Today, you will learn about separating and comparing groups.

Do you know what math operation is used when you separate or compare groups?



LESSON 1

If you said **subtraction** is the math operation you use to separate or compare groups, you were right! What is left after subtracting one number from another is the **difference**.

Subtraction is used to take away an amount from a total or to find out how many more are in one group than another. Students do not always remember the comparing function of subtraction.

1. Sarah bought 16 tickets to go on rides at the fair. She used 8 of the tickets. How many tickets does she have left?

a. What math operation can Sarah do to figure out how many tickets she has left?

_____

Take several counters or pennies from your Math Box.

Use the counters to help solve Sarah's problem. Count out 16 objects. These objects will stand for Sarah's tickets. Now remove 8.

b. How many do you have left?

_____

If necessary, review the symbol used to show subtraction (−).

c. Write a number sentence to show what you did.

_____

Subtraction equations can be written in two ways.

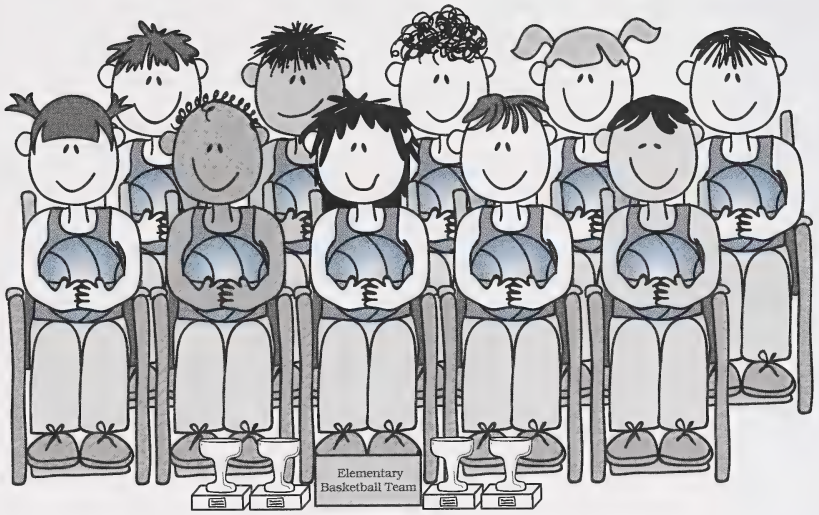
$16 - 8 =$ or $\begin{array}{r} 16 \\ -\ 8 \\ \hline \end{array}$

d. How many tickets does Sarah have left?

_____

Subtraction is also used when you want to find out how many more are in one group than another group.

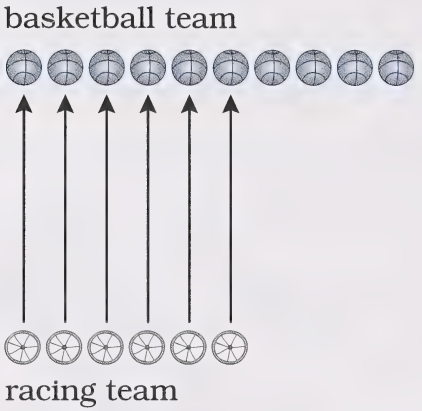
2.



Luke belongs to a wheelchair-racing team and a basketball team. The racing team has 6 members. The basketball team has 10 members. How many more members does the basketball team have?

If your student has trouble understanding why you would match the objects, try comparing some concrete groups in your home. For example, ask your student if there are more oranges or apples in the fruit basket. Have the student take out the fruit and compare the groups. Then match the fruit one to one to find out how many more there are. Your student may discover the groups are equal and that there are zero more.

Match each racing team member to a basketball team member.



How many more basketball team members are there?

The equation for this problem could be written in two ways.

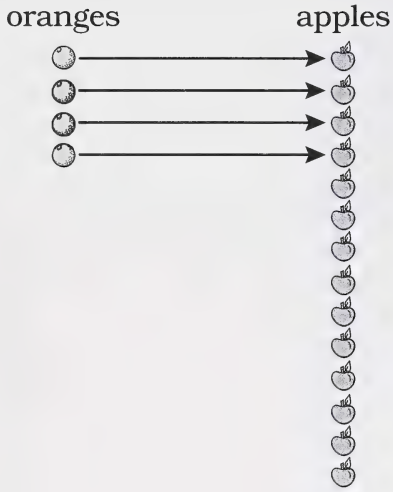
$10 - 6 = 4$ or $\begin{array}{r} 10 \\ -\ 6 \\ \hline 4 \end{array}$

When you compare two groups, subtraction is used to find the answer.

3. Write a subtraction number sentence for each of the pictures below.

a. _____

b. _____



c. _____

4. Solve each equation. Then draw a picture for each number sentence.

a. $10 - 3 =$ _____	b. $12 - 7 =$ _____

LESSON 2

You were shown how to solve some subtraction problems in grade two. Try to solve the problems below without using counters.

1. a. $6 - 3 =$ _____ b. $8 - 6 =$ _____ c. $5 - 4 =$ _____

Now try these questions. Use counters, pictures, or any other strategy you like to get the answers.

2. a. $12 - 5 =$ _____ b. $15 - 8 =$ _____ c. $18 - 9 =$ _____

d. $14 - 9 =$ _____ e. $12 - 6 =$ _____ f. $13 - 4 =$ _____

Tell your home instructor what strategies you used to find the answers.

Your student may have developed strategies in grade two to help with subtraction equations. Ask how each equation was solved.

DAY 6: COUNTING BACK

You have learned several ways to remember or figure out addition facts. Now you will practise strategies for subtraction.

In earlier grades, you learned to count forward and backward. Have you ever tried counting back to solve subtraction questions?

You can also use what you know about doubles to help you subtract.

LESSON 1

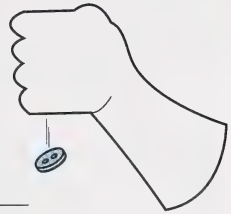
If you can add and subtract quickly, you will find it much easier to do the math activities this year. Counting on and counting back can help you solve equations.

When you subtract, you are usually taking some away from a total. Instead of counting on like you did for adding, you can count back.

Try counting backwards from 20 for your home instructor.

Take about 25 small counters from your Math Box.

Put 10 counters in your hand. Drop one.



1. How many do you have left? _____

2. Did you have to count the objects to know that? _____

Continue dropping counters and telling your home instructor how many you have left each time.

Counting back is most useful for subtracting 1, 2, 3, or 4. Some students become very good at counting back by using their fingers to keep track of how many places they have counted back.

If your student has difficulty counting backward, take some time to practise it. Your student will need to count backward when number pattern skills are studied.

Counting Back Game: Pick up 10 to 18 counters in your hand, and let your student count them. Drop one, two, or three counters and have the student count back to find out how many are left in your hand. Open your hand to show the student if his or her guess was correct. For example, pick up 11 counters. Then drop 3 counters. As you drop each counter, have your student say, "10, 9, 8." Ask how many are left. Repeat this several times.

A common problem students have is to say the total number when they drop the first counter. Remind the student that when the counter is dropped there is one less in the hand, so it is one less than the total. For example, to do 16 – 3, the student would have 16 counters and then drop one and say 15, 14, 13.

If you have the numbers to 100 posted in the room, your student may count back using that visual aid.

Now play the Counting Back Game with your home instructor. Your home instructor will show you how many counters he or she has and then let you count back to find out how many are left.

3. Use counters to help you solve these problems. Drop the counters and count back to find the answer.

   a. 16 – 3 = _____ b. 14 – 5 = _____ c. 10 – 2 = _____

To help you count back in your head, you can imagine the numbers written in a line. Then think about moving back along this line to subtract.

Try this equation using the line of numbers below.

18 – 3 = _____

1 2 3 4 5 6 7 8 9 10 11 12 13 14 **15** **16** **17** **18** 19 20

Solve the equations below by counting backward. You may use the numbers above if you wish.

4. a. 12 – 4 b. 15 – 3 c. 9 – 2 d. 10 – 4

LESSON 2

You can use the facts you know about doubles to help you subtract.

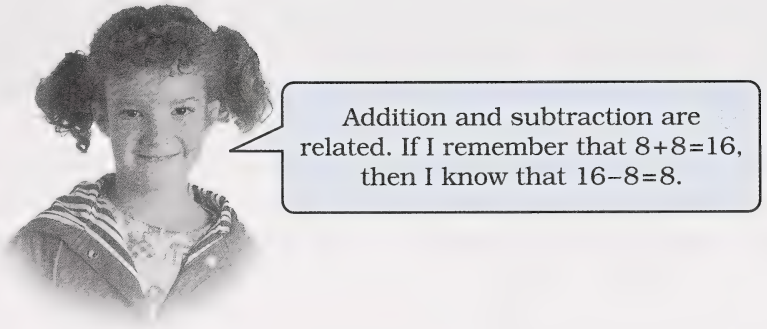
1. Use your counters to do these equations.

   a. 14 – 7 = _____ b. 18 – 9 = _____ c. 12 – 6 = _____

   d. 16 – 8 = _____ e. 10 – 5 = _____ f. 8 – 4 = _____

2. What did you notice? _____

   _____



It is very important that students understand the relationship of addition and subtraction. Using concrete materials helps them see this relationship. Related facts are often referred to as fact families or number families. Your student has probably worked with this concept in grade one and grade two.

Related facts are sometimes called **fact families** or **number families**. You will do more work with fact families in Day 7.

Are you ready for your timed exercise? Ask your home instructor to time you for 2 minutes. Write how many you completed. Ask your home instructor to mark the questions and to write how many were correct.

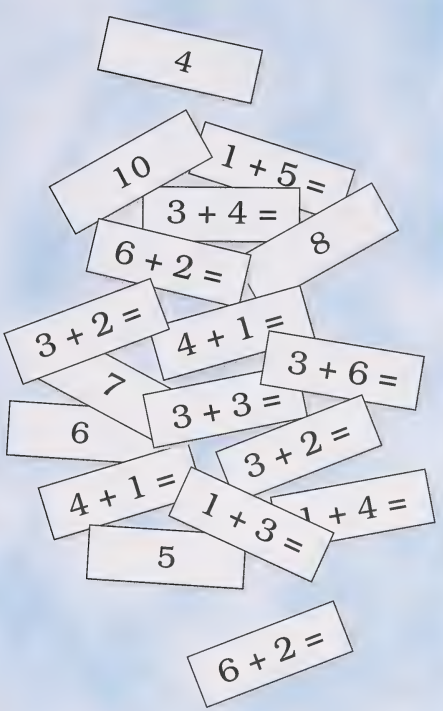
Good luck!

TIMED EXERCISE: 2 MINUTES

$\begin{array}{r} 7 \\ +\ 8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +\ 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ +\ 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +\ 2 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +\ 9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +\ 3 \\ \hline \end{array}$

5+7=_____	8+4=_____	4+4=_____	2+8=_____
4+5=_____	8+6=_____	3+9=_____	7+6=_____
9+9=_____	4+9=_____	9+5=_____	3+3=_____

Number completed	
Number correct	



EXTENSION ACTIVITIES

If you have trouble remembering the addition and subtraction facts to 18, you may need to do extra practice.

FLASH CARDS

A fun way to practise is with flash cards. You can make flash cards with the question on the front and the answer on the back.

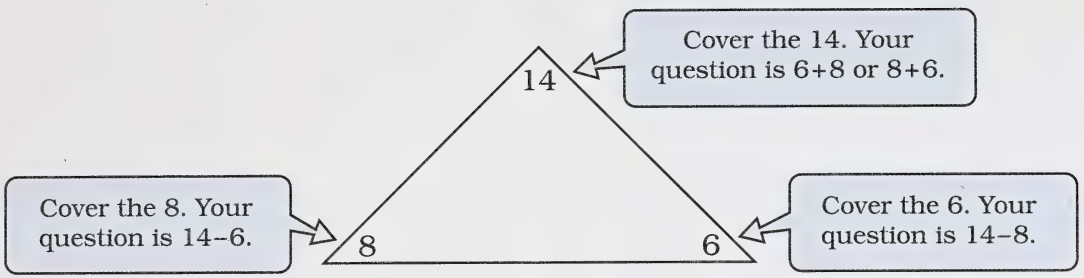
6 + 7 =	13

Look at the fact and say the answer. Then check the back to see if you were right.

It is a good idea to also make a set of small flash cards with the question on one side and no answer on the back. These can be used for games.

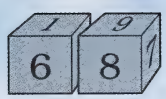
You can also make triangular flash cards like the one on the next page. They can help you with related facts. Put a number from one to nine in the corner of the triangle. Choose another number from one to nine for the next corner. In the third corner, write the sum of the first two numbers.

Cover one part of the flash card with your thumb, and use the other two numbers to make up a fact question. The number under your thumb is the answer.



NUMBER CUBES

If you have old blocks or other cubes, you can make number cubes. Write the numbers 1 to 6 or 4 to 9 on two cubes. Shake the cubes and add the two numbers that are face up.



GAMES

You can make up adding and subtracting games using flash cards, number cubes, playing cards, or dominoes.

Do you know how to play a concentration game? You can play it with your home instructor or someone else in your home.

Using a game format makes practising facts more enjoyable. If there are other students who need practice learning the facts, you ca have flash card races. Show a card to two students. The student who can answer first gets the card. Keep playing until all the cards are gone, and count who got the most cards at the end. Many popular board games, such as *Snakes and Ladders*, can be adapted so the student has to answer a fact flash card to move on. Use your imagination and have fun

Use flash cards with questions but no answers on the back. Turn the cards face down and mix them around. Now try to turn over two cards that equal the same answer. If the two cards have the same answer, you can keep them and have another turn. If the answers don't match, turn the cards face down again and your opponent gets a turn. Try to remember where cards with matching answers are.

Playing cards or dominoes can be used to create addition questions much like a flash card. Choose the combinations that your student has the most trouble remembering. For example, if your student is having trouble remembering 9 + 7, be sure to use the dominoes or cards with 7 and 9 on them.

You can also play a game of concentration using dominoes by trying to find two dominoes with the same totals.

DAY 7: NUMBER FAMILIES

Did you know that numbers can be related? Related groups of equations are sometimes called fact families or number families.

Today, you will recall how fact families can make it easy to do subtraction.

Using concrete items can help students see the relationship between addition and subtraction.

LESSON 1

Take several pennies from your Math Box.

Put 15 pennies on the table in front of you. Use them to find the answer in the following stories.

1.

Sarah had 15 cents after she visited the fair. On the way home, she spent some money on candy. She has 6 cents left. How much did she spend on candy?

To solve this problem, think in terms of addition. Think 6 plus what equals 15.

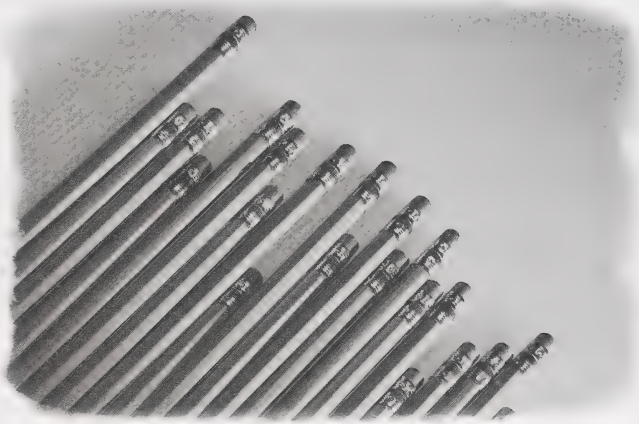
$6 + \_\_\_\_\_ = 15$

Cover up 6 of your pennies.

a. How many pennies are left? _____

b. Sarah spent _____ on candy.

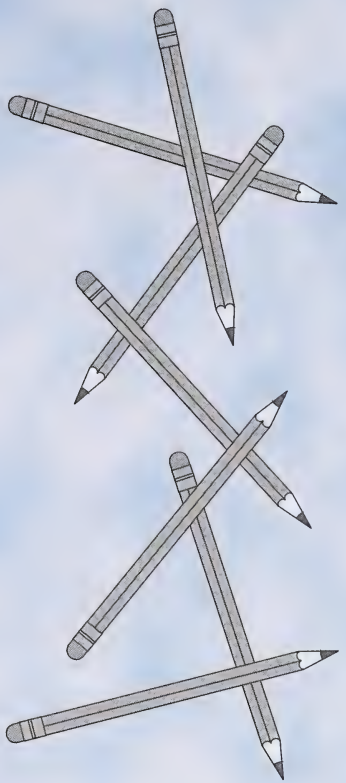
2. Luke has 15 cents. He bought a new pencil. He has 7 cents left. How much did the pencil cost?



To solve this problem, think of addition. Think 7 plus what equals 15.

a. Write an addition number sentence to show this.

_____



Cover up 7 of your pennies.

b. How many pennies are left? _____

c. The pencil cost _____ cents.

Use your pennies to find the missing part in these equations.

3. a. $5 + \_\_\_\_\_ = 15$ b. $9 + \_\_\_\_\_ = 15$

c. $8 + \_\_\_\_\_ = 15$

When you found the missing part in these questions, you were actually subtracting.

To solve $8 + \_\_\_\_\_ = 15$, you must think $15 - 8 = \_\_\_\_\_$.

LESSON 2

1. Solve the questions below. Use counters if you need to.

   a. $7 + 8 =$ _____ b. $8 + 7 =$ _____

   c. $15 - 8 =$ _____ d. $15 - 7 =$ _____

2. Try a few more. How are addition and subtraction related?

   a. $9 + 3 =$  b. $3 + 9 =$ 

   c. $12 - 3 =$  d. $12 - 9 =$ 

Tell your home instructor what you noticed about these groups of facts.

Encourage your student to explain how the numbers are related. The student should realize that the order of the addends can be changed without changing the sum. The student should also realize that when you take one of those addends from the total, you are left with the other addend. Your student may mention that the same three numbers are used in each equation.

When you add, two groups or parts make a total.

part	+	part	= total
6	+	8	= 14

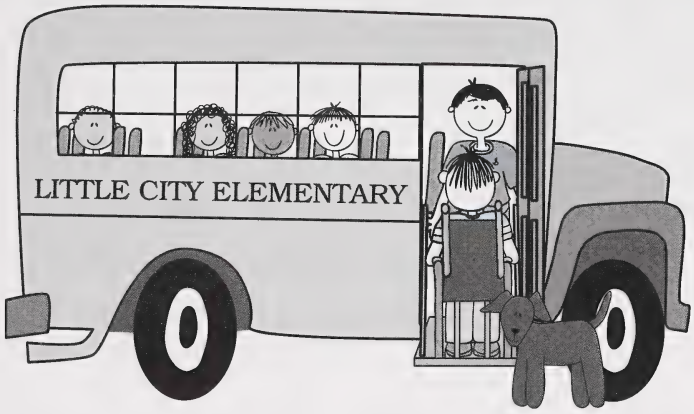
Switching the two parts around doesn't change the total.

part	+	part	= total
8	+	6	= 14

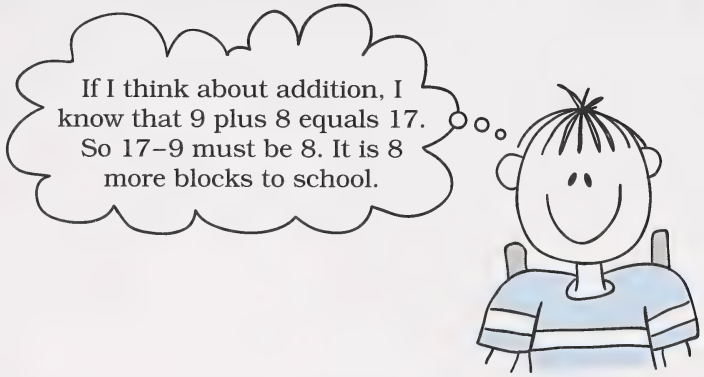
When you work with subtraction facts, the total comes first, then you take a group or part away from the total.

total	–	part	= part
14	–	8	= 6
14	–	6	= 8

When you see a subtraction question, think about the related addition fact to help you remember the answer.



Luke travels to school every day in a bus. He knows that his school is 17 blocks from his home. He has travelled 9 blocks already, and he wants to find out how much further it is to school.



$9 + 8 = 17$

$8 + 9 = 17$

$17 - 8 = 9$

$17 - 9 = 8$

The related facts are called a fact family or number family. The same three numbers are used in different combinations.

3. Complete the fact families below by writing the related subtraction facts. The first one is done for you as an example.

	Addition Facts		Subtraction Facts	
a.	$7+4=11$	$4+7=11$	$11-7=4$	$11-4=7$
b.	$6+9=15$	$9+6=15$	_____	_____
c.	$3+8=11$	$8+3=11$	_____	_____
d.	$5+7=12$	$7+5=12$	_____	_____
e.	$9+2=11$	$2+9=11$	_____	_____
f.	$5+9=14$	$9+5=14$	_____	_____
g.	$9+7=16$	$7+9=16$	_____	_____

For extra practice with addition and subtraction facts, check the websites below. Many of the interactive activities are in the form of games where you can choose easy, medium, or hard questions.

- **http://www.funbrain.com**
  Try the games *Math Baseball, Tic Tac Toe Squares,* or *MathCar Racing.*

- **http://www.aplusmath.com**
  There are addition versions of several games in the part titled *Game Room.* If you choose *Flashcards,* you can practise facts or print your own flash cards.

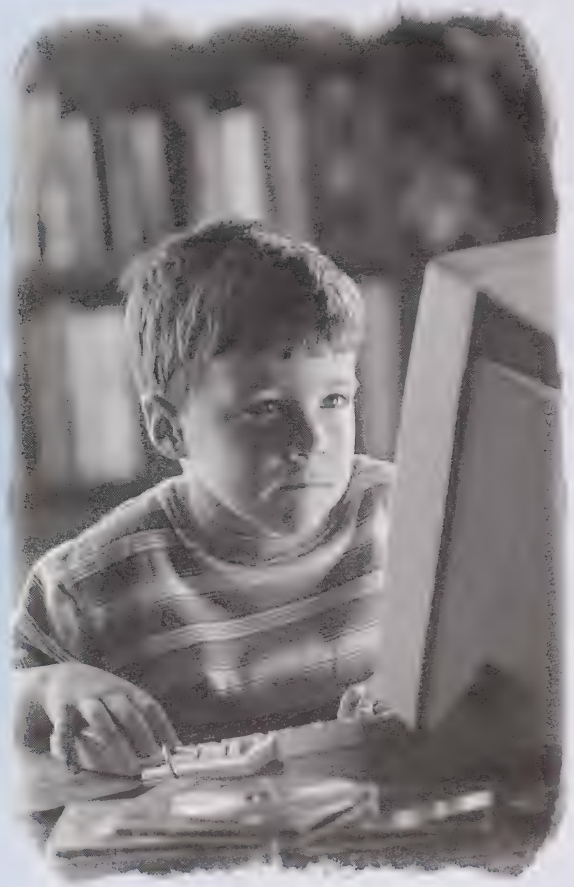
You have studied several strategies to help you remember or figure out subtraction facts. Now it's time to show the teacher what you have learned.

Go to Assignment Booklet 1A.

DAY 8: PROBLEM SOLVING

Problems in real life don't come neatly written up like the ones you see in math textbooks. You often have to think very carefully to solve problems. Problems may have more than one step, or they may have missing information you need to know or must find out.

In today's problem-solving questions, you will use what you have learned about subtraction. You will also practise doing problems with more than one step or with bits of missing information.



LESSON 1

In addition problems, you learned that the words *more, altogether, join,* or *in all* meant that you should add to find the answer.

1. Write some words that would tell you to subtract.

_____ _____

_____ _____

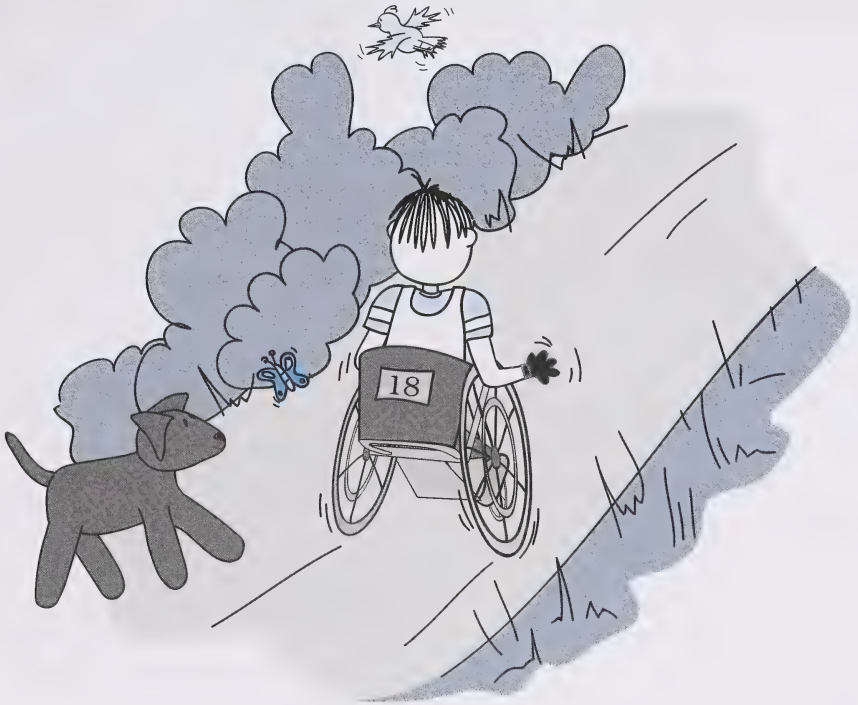
Encourage your student to think of real-life problems that involve subtraction. What words cued the student to subtract?

If your student has difficulty thinking of words, make up a couple of subtraction word problems orally. Ask the student to listen carefully for the words.

Sometimes problems do not include all the information you need. Do you remember the problem about the Ferris wheel on Day 4? Sarah had to figure out how many people could go on the ride each time to answer that question.

Use the four steps you learned on Day 4 to help you solve the following problem. Watch for missing information.

If you have trouble deciding what to do, sometimes it helps to act out the problem using counters or other real objects. You will learn more about ways to solve problems as the year goes on.



Luke's wheelchair-racing team was going on a two-week trip to the Special Olympics. The team had to race on 6 of the days. On the other days, they had free time to tour with their families. How many days would they get to tour?

Understand the problem.

2. What do you have to find out ? _____

_____

Make a plan.

3. a. How will you solve the problem?

_____

b. Is there missing information?

_____

c. What do you need to know to answer this question?

_____

Try the plan.

4. a. Write a number sentence and solve it.

_____

b. Write your answer in a complete sentence.

_____

_____

Look back.

5. Does your answer make sense?

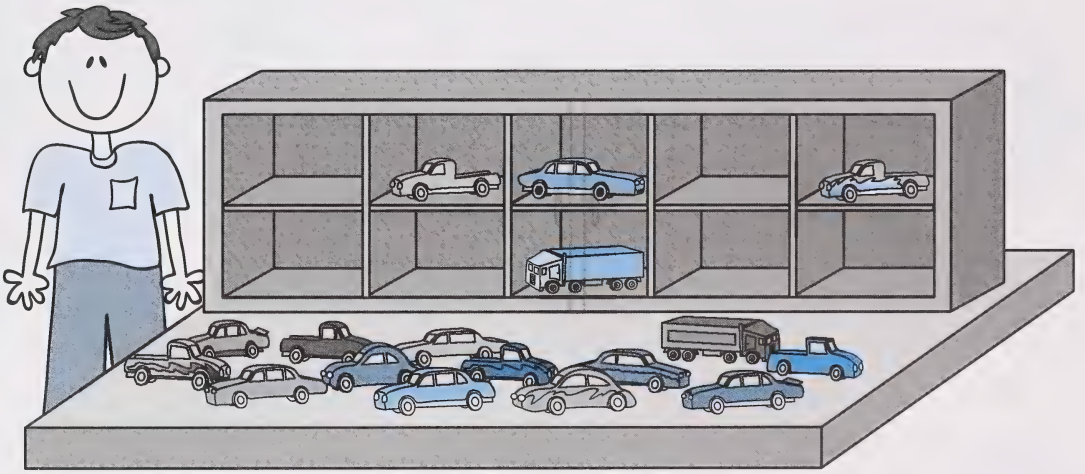
_____

_____

In this problem, you had to know that two weeks is 14 days. It wouldn't make sense to write 2 (weeks) – 6 (days). You had to change the weeks to days to make it possible to find the answer.

LESSON 2

Sometimes, problems take more than one step to solve. At times, you have to calculate two or more things to find the answer. You may have to use more than one math operation.



Sarah's friend Gino collects model vehicles. Gino has 9 model cars and 8 model trucks. He has a display case with 10 places. How many vehicles will not fit in his display case.

Ask, "How many vehicles will fit into the case? Now you need to find out how many of Gino's vehicles will not fit into the case. What operation do you use when you take some objects from a larger group?"

If your student has trouble with this problem, use real objects to act it out. If necessary, draw a display case for the student to place counters onto. Discuss the math operations as you go, so the student connects the real experience to math symbols. For example, you could say, "We have 9 cars and 8 trucks. We need to find out how many there are altogether. Is that adding or subtracting?"

Understand the problem.

1. What do you have to find out? _____

Make a plan.

2. a. How will you solve the problem? _____

   b. What do you have to do first? _____

   c. What do you have to do next? _____

Try the plan.

3. a. Write the equations, and solve them. _____ _____

   b. Write your answer in a complete sentence. _____

   _____

Look back.

4. Does your answer make sense? _____

Go to Assignment Booklet 1A.

DAY 9: CHECKING YOUR WORK

There are times when you want to be very sure that you have the right answer to a calculation. If you are counting out money for someone, adding the score on a game, or doing a test, you may want to check your work to make sure it is correct.

In today's lessons, you will learn about ways to check your addition and subtraction answers.

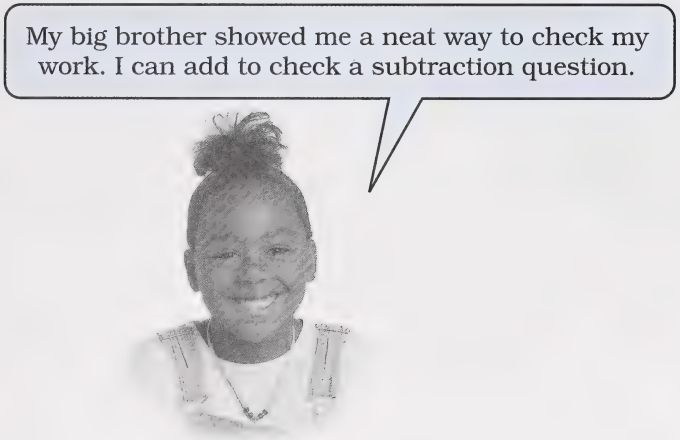
LESSON 1

When it is very important to have the right answer on a calculation, you may want to check your work. You could do it over again, but you might make the same mistake twice.

Discuss with your student, times when you have double-checked your mathematical calculations.

People make sure they have the right answer by checking their work in different ways. Can you think of some ways that people check their calculations? Tell your home instructor.

Allow your student to make suggestions about ways people check answers. Suggestions may include mechanical means, such as calculators, computers, and cash registers. Sometimes people get another person to check for them. Share ways that you check answers.



You have learned that addition and subtraction are related. They are called **inverse** or opposite operations. When you add, you put groups together to make a total. When you subtract, you take a group from a total. You are doing the opposite thing. You can use this relationship to check your work.

The student may not be familiar with the term inverse.

Sarah sold her young rabbits to the pet store in town. She got $15 for them. She spent $8 to buy more rabbit food. The pet store owner gave her $7. Did she get the right change?

Sarah used a trick to check the calculation. She added the last two numbers of the subtraction equation to check the answer.

$15-8=7$

When you add the last two numbers you should get the first number $(8+7=15)$.

$$\begin{array}{r} 15 \\ -\ 8 \\ \hline 7 \end{array}$$

When Sarah added $8+7$, she got 15. She knew that the shopkeeper had given her the right change.

Sarah knew that when you add the last two numbers of a subtraction equation (the last two parts), you should get the first number (the total).

1. Add the last two numbers of each equation to check the answers below. Show your number sentence. Is the answer correct or incorrect? The first one is done for you.

a. $18-9=8$ **$9+8=17$** The answer is **incorrect**.

b. $16-7=9$ _____ The answer is _____.

c. $14-5=8$ _____ The answer is _____.

d. $12-4=6$ _____ The answer is _____.

e. $10-8=2$ _____ The answer is _____.

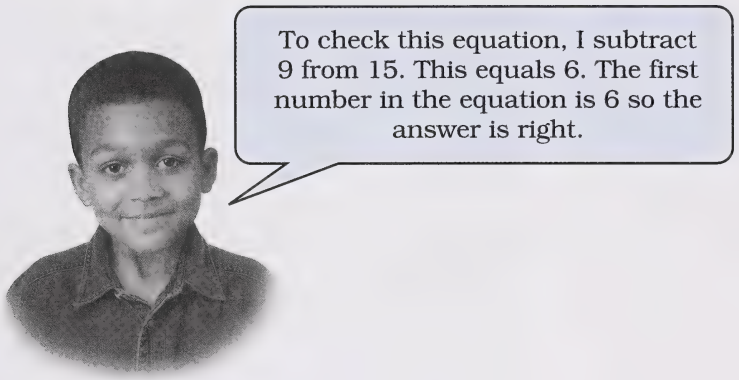
f. $17-8=8$ _____ The answer is _____.

If necessary, remind the student that the sum of the addition equation should equal the first number in the subtraction equation.

You can use what you know about fact families to do this checking in your mind. If you know that $9+9=18$, then you can see at a glance that $18-9$ cannot equal 8.

You can check addition questions the same way, by subtracting or thinking of the related subtraction fact.

6+9=15



2. Subtract, and then write **correct** or **incorrect**. The first one is done as an example.

a. 8 + 8 = 16 **16 – 8 = 8** The answer is **correct**.

b. 7 + 5 = 13 _____ The answer is _____.

c. 4 + 8 = 12 _____ The answer is _____.

d. 3 + 9 = 12 _____ The answer is _____.

e. 6 + 7 = 14 _____ The answer is _____.

f. 5 + 9 = 15 _____ The answer is _____.

When you worked with fact families, you noticed that the same three numbers are used for the addition and subtraction questions. This relationship is why Sarah's trick works.

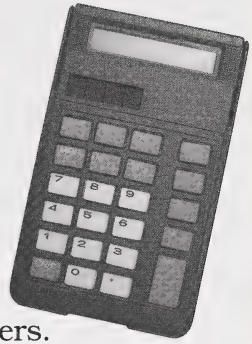
$8 + 7 = 15$ $\quad$ $15 - 8 = 7$

$7 + 8 = 15$ $\quad$ $15 - 7 = 8$

Remembering fact families can help you check your work.

LESSON 2

Take out your calculator.



You have probably noticed adults using a calculator to check their work. Calculators are handy for checking answers.

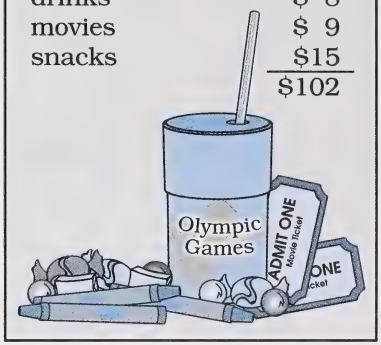
You probably know your addition and subtraction facts to 18, and you don't need a calculator to check your work. A calculator is most useful when you want to check the answers of more difficult questions.

When you work with a calculator, press the keys carefully and watch the display to be sure you entered the right number.

If your student is not familiar with a calculator, discuss the parts of it. Show the student where the keys are, and spend some time experimenting to discover what each key does. Also, discuss proper care of a calculator.

When Luke was on the trip to the Special Olympics, his parents gave him some spending money. Luke made a list of what he spent and added it up.

meals	$25
souvenirs	$12
clothes	$35
drinks	$ 8
movies	$ 9
snacks	$15
	$102



Use your calculator to check Luke's addition.

Enter a number, and then press [+]. Continute to add each number in this way. After the last number, press the [=].

[2] [5] [+] [1] [2] [+] [3] [5] [+] [8] [+] [9] [+] [1] [5] [=]

1. What answer did you get on the calculator? _____

2. Look back at Luke's total. Was Luke's total correct? _____

3. Look at the work below. Use your calculator to check the totals. Put a check mark (✓) beside the answers that are correct and an ex (✗) beside the answers that are incorrect.

   a. $9 + 7 + 8 + 3 + 6 + 5 + 7 = 47$

   b. $96 + 25 + 73 + 89 + 24 = 307$

   c. $289 + 654 = 940$

   d. $145 + 567 + 89 = 801$

Go to Assignment Booklet 1A. When you finish the assignment for today, you will complete the Student Checklist.

DAY 10: CHOOSING AN OPERATION

Before you can solve a math problem, you have to plan what to do. An important part of this plan is deciding whether you need to add or subtract to find the answer.

In this lesson, you will learn more about how to choose the operation that will help you solve the problem.

LESSON 1

You have learned that the words used in a problem can give you a clue about what operation to do.

1. Write some words that tell you to add.

_____ _____

_____ _____

2. Write some words that tell you to subtract.

_____ _____

_____ _____

These words were discussed on Day 1 and Day 8. Review these lessons if necessary.

Words that tell you to combine or join groups to find a total are used to show addition. Words that tell you to remove or separate groups from a total show subtraction. When groups are compared to find out how many more there are in one group than another, you also subtract.

3. Write **add** or **subtract** on the line to show what operation you would use to solve each problem.

   a. How many oranges and bananas are in a fruit bowl? _____

   b. How many cars are left on the parking lot after some drive away? _____

   c. How many more raisins are in your cereal than in your sister's? _____

   d. How many stickers do you and a friend have altogether? _____

   e. What is the cost of buying presents for three cousins? _____

LESSON 2

When you solve a problem, you need to decide on the operation you will use. Next, you need to think about the number sentence you will write.

1. Try the questions below. Read the problem, and decide whether you should add or subtract. Then write an equation.

   a. There were 12 children on the playground. Three went home. How many are left?

   _____

   b. Sarah's cats had kittens. One cat had 4 kittens, one cat had 6 kittens, and another cat had 8 kittens. How many kittens are there in all?

   _____

   c. Luke collects sports cards. He has 18 hockey cards. His friend has 9. How many more cards does Luke have than his friend?

   _____

Now you can make up some problems of your own. Be sure to include all the necessary information. Then solve your problem by writing an equation and a sentence.

2. Make up your own subtraction story, and solve it.

3. Make up your own addition story, and solve it.

Follow the steps to solve these problems. Think about whether you need to add or subtract.

4.

Sarah's kittens ate 6 cans of cat food in September and 8 cans in October. How many cans did they eat in the two months?

Understand the problem.

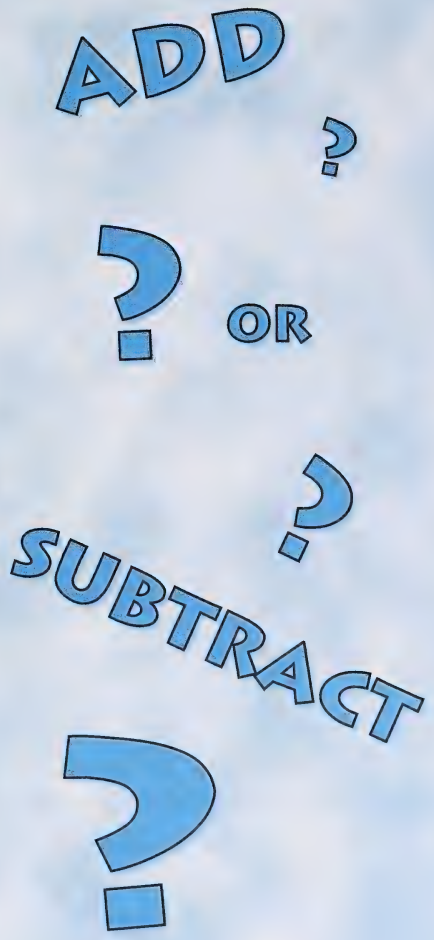
a. What do you have to find out? _____

_____

Make a plan.

b. How will you solve the problem? _____

_____



Try the plan.

c. Write an equation, and solve it. _____

_____

d. Write your answer in a complete sentence. _____

_____

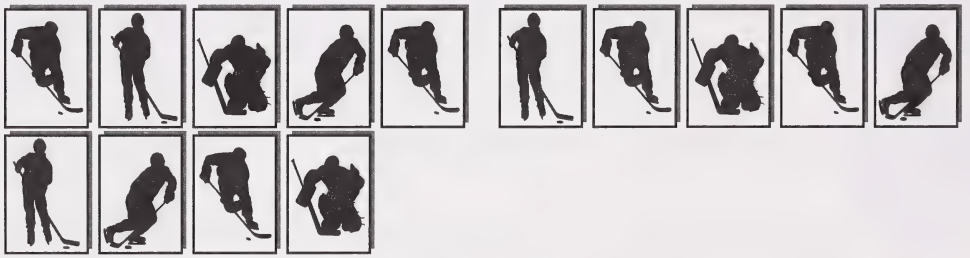
Look back.

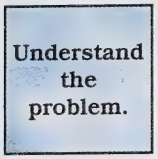
e. Does your answer make sense? _____

_____

How did you do? Try one more.

5. Luke has 14 hockey cards. He traded 9 of his cards for a display album. How many cards does he have left?





a. What do you have to find out? _____

_____

b. How will you solve the problem? _____

_____

c. Write an equation, and solve it. _____

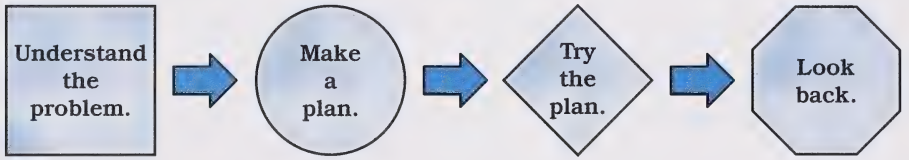
d. Write your answer in a complete sentence. _____

_____

e. Does your answer make sense? _____

_____

Now that you understand the four problem-solving steps, try to do them in your head. You still need to write an equation and a complete sentence.



6.

You rode 15 kilometres on your bike. Your friend rode 8 kilometres. How many more kilometres did you ride?

a. Write the equation: _____

b. Write the sentence: _____

_____

You can search for math problems for students by using a search engine such as yahooligans.

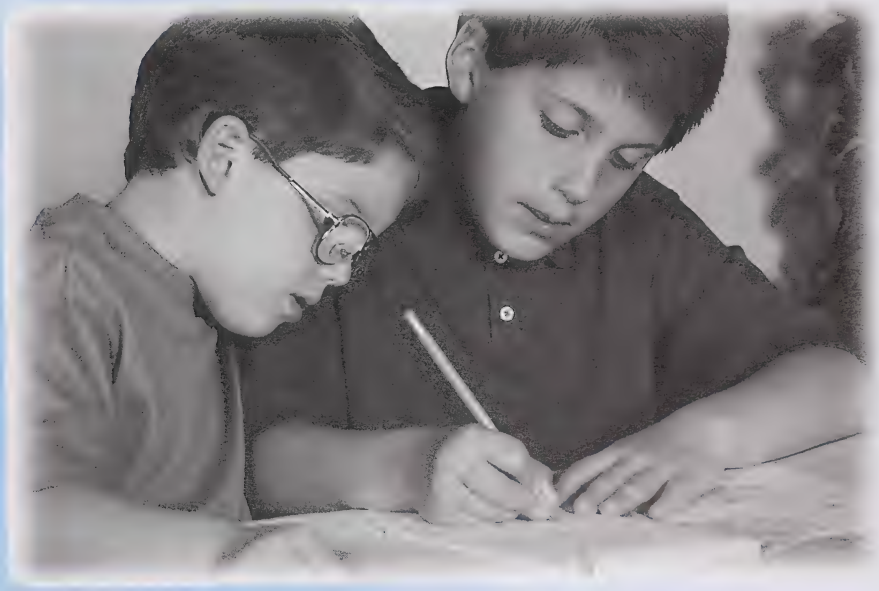
Many math software programs with problem solving are available and provide a fun way to practise.

Go to Assignment Booklet 1B.

DAY 11: ADDING LARGE NUMBERS

When you were little, you could probably count only to 10 or 20. As you grew older, you could understand larger and larger numbers. Many of the problems that you need to solve in real life involve adding or subtracting these larger numbers.

For the next few days, you will be working on adding and subtracting larger numbers.



LESSON 1

Knowing the number facts to 18 makes it easier to add larger numbers. You probably added sums to 100 in grade two. See if you can help Luke with his sports cards.

Luke has space for 25 sports cards in his new display album. He has 18 hockey cards and 21 baseball cards. How many cards does he have altogether. Does he have enough space for all of them?

Your student was probably introduced to adding sums to 100 in earlier grades. In today's lesson, addition without regrouping will be discussed. The student will practise with concrete materials, pictures, and then equations.

Your student may suggest adding by using concrete objects, drawing pictures, or some of the other strategies that have been discussed earlier.

How could Luke figure out how many cards he had in all? Tell your home instructor.

Take out your base ten blocks. Find the "Place-Value Mat" in the Appendix, and glue the pages together as directed.

Use base ten blocks to help Luke solve the problem.

Understand the problem.

Luke wants to find out how many cards he has altogether. He also wants to know if there is enough room in his album for them.

Make a plan.

Luke will need to add the cards to find the total.

Try the plan.

Luke wrote the equation $18 + 21 =$ _____. He decided to use his base ten blocks to help him find the answer.

He knew that 18 was the same as 1 ten and 8 ones, so he put those blocks on the place-value mat. He knew 21 was the same as 2 tens and 1 ones, so he put them on the mat, too.

On your student's own mat, ask the student to show Luke's calculations.

Luke's Place-Value Mat

Hundreds (100)	Tens (10)	Ones (1)
	▭ ▭ ▭	□ □ □ □ □ □ □ □ □

Your student should readily recall that 18 can also be called 1 ten and 8 ones. If your student has trouble representing numbers, practise with several examples. For example, ask your student to show you 46 on the place value mat. Ask, "How many tens in 46?" "How many ones?" Then restate, "46 is the same as 4 tens and 6 ones."

Look at Luke's Place-Value Mat.

1. How many ones does Luke have altogether? _____

2. How many tens does Luke have altogether? _____

3. Now finish the equation for Luke: 18 + 21 = _____

If necessary, remind your student that 3 tens and 9 ones is the same as thirty-nine.

4. Luke has _____ cards altogether.

5. Does Luke have enough spaces in his album? _____

_____

Use your base ten blocks and your place-value mat to add the equations below.

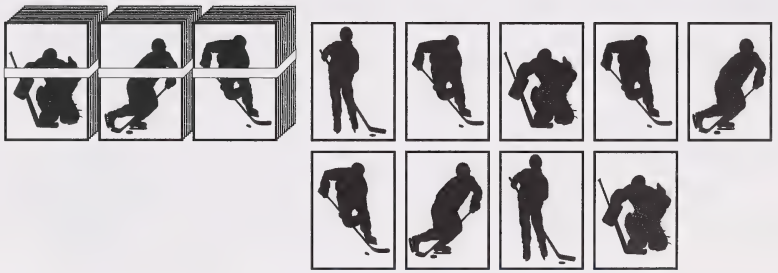
6. a. $34 + 25 =$ _____ b. $43 + 52 =$ _____ c. $22 + 60 =$ _____ d. $65 + 12 =$ _____

Put your base ten blocks and your place-value mat in your Math Box.

LESSON 2

Luke could have solved the problem by counting the cards. If you have ever counted large groups of things one by one, you know that it takes a long time. Putting things into groups of 10 makes it easier to count them.

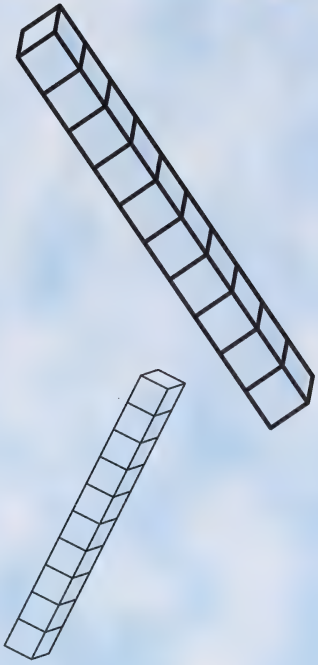
Luke sorted his cards like this:



It is easy to see that Luke has 39 cards altogether.

If you don't have real objects to sort, you can draw pictures to help you.

1. Solve the number sentence below by drawing a picture. Remember, it is much faster to group the objects into groups of 10.



26+33=_____

2. Here is one more to try. Is it getting easier?

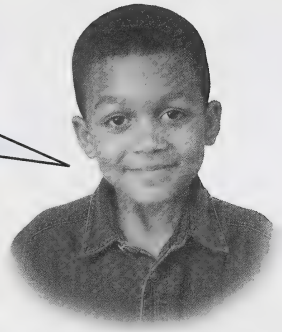
41+12=_____

LESSON 3

You may remember that there is a quicker way to add larger numbers. You know that equations can be written across the page or up and down. Writing the equation up and down can make it easier to solve.

In grade two, I learned that you could write the equation with the numbers one over the other, lining up the ones and the tens. Then you add up the ones and you add up the tens.

$$\begin{array}{r} 18 \\ +\,21 \\ \hline 39 \end{array}$$



Make sure the ones and tens are lined up together. Some people use a chart to help them.

Tens	Ones
1 2	8 1
3	9

Using the vertical notation makes it easier for the student to add the tens and ones, but be sure the numbers are placed with the ones lined up and the tens lined up. The chart below can be used if your student has a problem doing this.

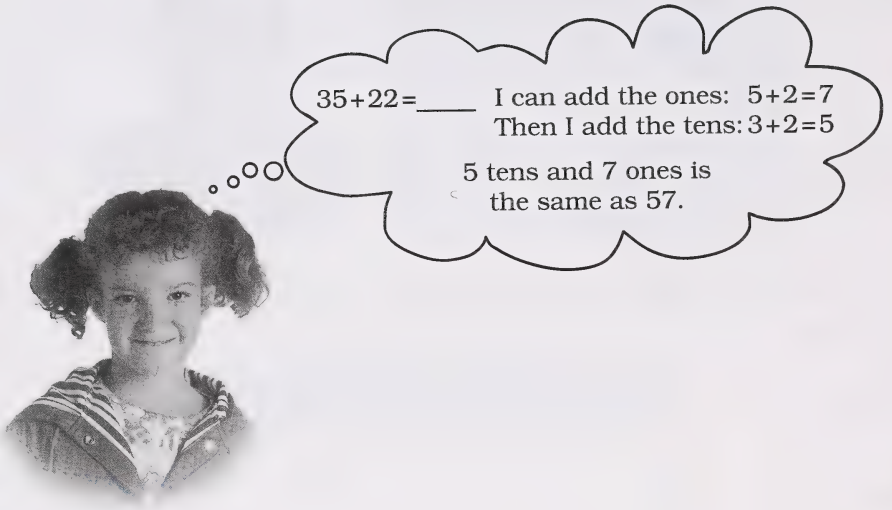
Solve these questions by adding the ones and then adding the tens.

1. $\begin{array}{r} 46 \\ +\ 23 \\ \hline \end{array}$

2. $\begin{array}{r} 35 \\ +\ 32 \\ \hline \end{array}$

3. $\begin{array}{r} 76 \\ +\ 3 \\ \hline \end{array}$

When you know your addition facts well, you can add large numbers



Go to Assignment Booklet 1B.

DAY 12: SUBTRACTING LARGE NUMBERS

What you know about adding large numbers can help you subtract too.

Today's lesson will discuss subtracting large numbers.


Timed Exercise

NAME _____

Great Job!

ADDITION

1. 75 + 26 = 101
2. 68 + 21 = 89
3. 31 + 42 = 73
4. 42 + 34 = 76
5. 62 + 14 = 76
6. 49 + 62 = 111
7. 12 + 81 = 93
8. 10 + 51 = 61

SUBTRACTION

9. 76 − 62 = 14
10. 84 − 43 = 41
11. 43 − 32 = 11
12. 85 − 14 = 71
13. 91 − 70 = 21
14. 68 − 61 = 07
15. 41 − 23 = 18
16. 30 − 20 = 10

LESSON 1

Subtracting numbers to 100 was covered in grade two. Your student should recall some strategies for subtraction. Today's lesson will review some of those strategies.

Can you remember some ways you learned to subtract large numbers last year? Tell your home instructor.

Using real objects is one way to subtract.

Take your base ten blocks from your Math Box. Also, remove the place-value mat.

Use your blocks to solve the problem below.

1. Sarah has $78 in her bank account. She wants to buy another cage, so she can raise more baby bunnies. A new cage costs $55. How much will she have left in her bank account if she buys the cage?

Understand the problem.

Sarah wants to know how much money will be left in her bank account.

Make a plan.

a. What operation will Sarah need to do to find the answer?

_____

Try the plan.

b. Write a number sentence to show how Sarah could solve her problem.

_____

c. Put 78 blocks on the place-value mat.

78 is the same as _____ tens and _____ ones.

Now, take away 55 blocks.

d. 55 is the same as _____ tens and _____ ones.

e. Write a sentence to show how many blocks you have left? _____

_____

Look back.

f. Sarah would have _____ left.

Sarah could also have acted it out with real money, if she had the correct bills and coins.

Use your base ten blocks and your place-value mat to solve these equations.

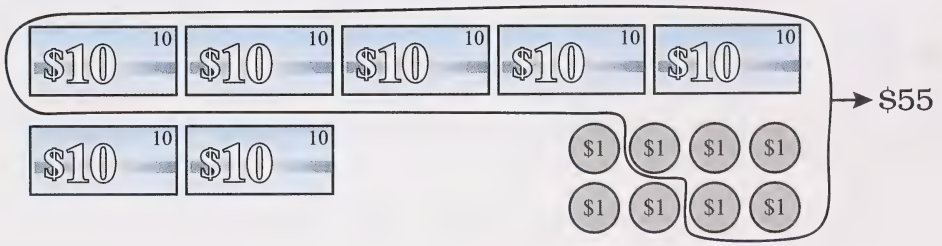
2. a. 76 – 23 = _____ b. 29 – 18 = _____

c. 97 – 33 = _____ d. 32 – 20 = _____

LESSON 2

The use of pictures and real objects helps the student visualize the subtraction process. Your student probably does not use these methods to solve most problems, but they will help prepare your student for regrouping activities, which will be discussed in the next day's lessons.

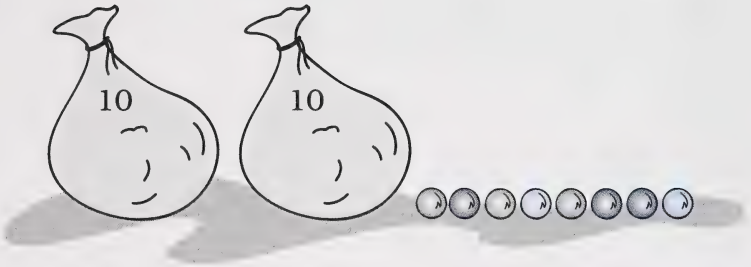
Sarah could have drawn a picture to help her solve the problem of 78 – 55.



1. You can see that Sarah has _____ left.

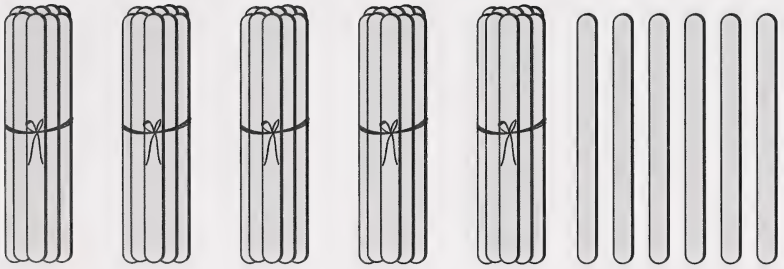
2. Use the pictures below to solve the questions. Draw a circle around the amount you are subtracting. What remains?

a.



28–17=_____

b.

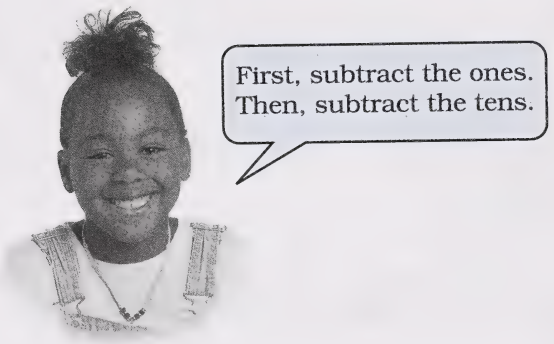


56–30=_____

LESSON 3

Do you use the method below to solve subtraction equations most of the time?

$$\begin{array}{r} 63 \\ -\ 21 \\ \hline 42 \end{array}$$



Solve these equations by subtracting the ones and then the tens.

1. $\begin{array}{r} 74 \\ -\ 34 \\ \hline \end{array}$

2. $\begin{array}{r} 29 \\ -\ 20 \\ \hline \end{array}$

3. $\begin{array}{r} 37 \\ -\ 12 \\ \hline \end{array}$

4. $\begin{array}{r} 69 \\ -\ 51 \\ \hline \end{array}$

5. $\begin{array}{r} 85 \\ -\ 44 \\ \hline \end{array}$

Are you ready for your timed exercise? Ask your home instructor to time you for 2 minutes. Write how many you completed. Ask your home instructor to mark the questions and to write how many were correct.

TIMED EXERCISE: 2 MINUTES

3 + 9	9 + 9	7 + 3	8 + 5
9 + 6	6 + 5	8 + 7	7 + 7

9+5=_____	6+3=_____	7+5=_____	8+9=_____
7+2=_____	4+8=_____	6+6=_____	4+7=_____
2+6=_____	8+3=_____	9+4=_____	5+5=_____

Look back at your Timed Exercise pages. Can you complete more now than you did on Day 4 and 6? Keep practising!

Go to Assignment Booklt 1B.

Number completed	
Number correct	

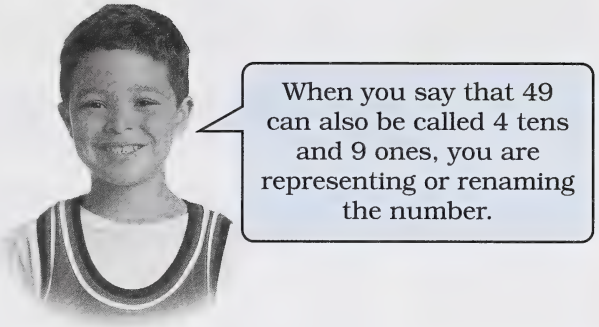
DAY 13: REPRESENTING AND REGROUPING

You probably know that different words can stand for or represent the same thing. A rabbit can also be called a bunny, or a horse can be called an equine. Did you know that numbers can be represented in different ways too?

In today's lessons, you will practise representing or renaming and regrouping numbers to help you add large groups.

LESSON 1

On Day 11 and Day 12, you practised renaming large numbers in different ways to help you add and subtract.



1. Describe the numbers below.

   a. The number 52 is the same as _____ tens and _____ ones.

   b. The number 37 is the same as _____ tens and _____ ones.

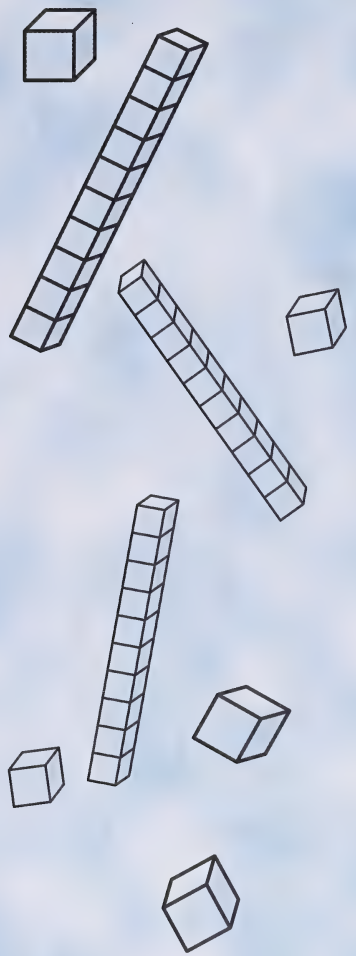
   c. The number 99 is the same as _____ tens and _____ ones.

   d. So, 6 tens and 4 ones is the same as _____.

   e. So, 7 tens and 0 ones is the same as _____.

If your student does not understand how to describe the numbers as tens and ones, use the base ten blocks and place-value mat to make each number. The student should quickly see that the two representatives mean the same thing.

Take your base ten blocks from your Math Box. Also remove your place-value mat that is in your Math Box.



There are other ways to show each number too. Use your base ten blocks and your place-value mat to do the activities that follow.

Show 32 on your place-value mat (as shown).

Hundreds (100)	Tens (10)	Ones (1)
	▯▯▯	▯▯

Exchange 1 of your tens for 10 ones. Put them in the ones column.

Hundreds (100)	Tens (10)	Ones (1)
	▯▯	▯▯▯▯▯ ▯▯▯▯▯ ▯▯

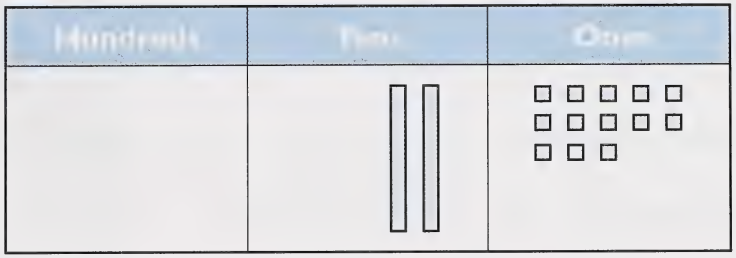
2. Do you still have 32 blocks? _____

3. How many tens do you have now? _____

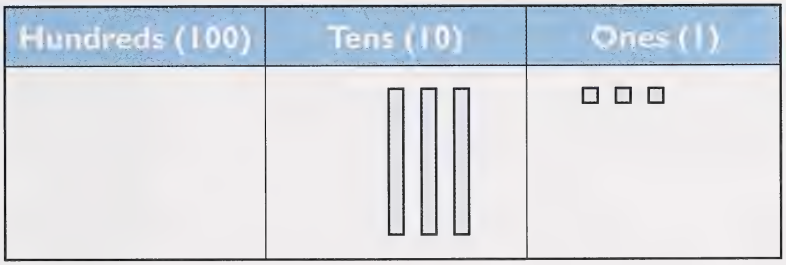
4. How many ones do you have now? _____

5. So, 32 can be described as 3 tens and 2 ones or _____ tens and _____ ones.

Now try another one. Put 2 tens and 13 ones on your place-value chart.



Now, trade 10 of your ones for 1 ten rod. Fix up the following place-value mat.



6. Now you have _____ tens and _____ ones or _____.

Use your base ten blocks and your place-value mat to find other ways to show each number.

7. a. The number 61 is the same as 6 tens and 1 ones or _____ tens and _____ ones.

   b. The number 53 is the same as 5 tens and 3 ones or _____ tens and _____ ones.

   c. The number 25 is the same as 2 tens and 5 ones or _____tens and _____ ones.

   d. So, 5 tens and 14 ones is the same as _____.

   e. So, 2 tens and 12 ones is the same as _____.

   f. So, 6 tens and 13 ones is the same as _____.

Trading tens for ones and ones for tens is called **regrouping**. The amount doesn't change, just the groups.

LESSON 2

Regrouping can help you add large numbers. Use your base ten blocks and your place-value mat to work out the following problem.

Sarah wanted to find out how much money she made selling rabbits this year. She got $27 for the first litter and $15 for the second litter.

Understand the problem.

Sarah wants to know how much money she made selling rabbits.

1. What operation does Sarah need to do?

_____

2. Write an equation to show how Sarah could solve her problem.

_____

Put 27 (2 tens and 7 ones) on the place-value mat.

Put 15 (1 ten and 5 ones) on the place-value mat also.

Now count the totals.

3. How many ones do you have? _____

4. How many tens do you have? _____

Trade 10 of the ones for a ten rod.

5. What do you have now? _____ tens and _____ ones

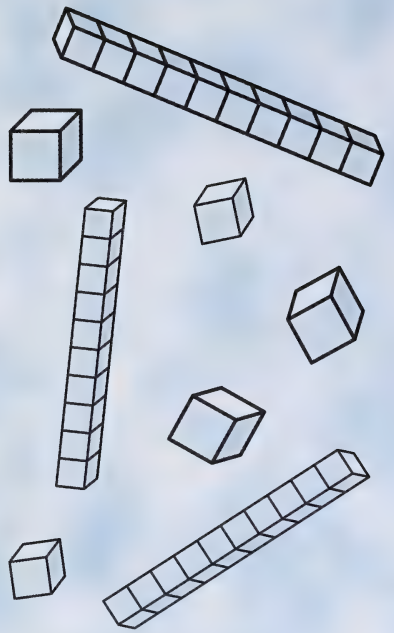
   or _____.

6. Sarah made _____ selling rabbits.

If necessary, remind the student that the amount must be written in dollars, since the problem is dealing with money.

Look back.

Does your answer make sense?



Use your place-value mat to do these equations. If there are more than 10 ones, trade 10 ones for a ten rod.

7. a. $54 + 18 =$ _____ tens and _____ ones, or _____

   b. $32 + 29 =$ _____ tens and _____ ones, or _____

   c. $46 + 34 =$ _____ tens and _____ ones, or _____

   d. $71 + 20 =$ _____ tens and _____ ones, or _____

LESSON 3

Working with base ten blocks takes a long time. There is a shorter way to add large numbers.

$36 + 46 = ?$

Although regrouping was introduced in the Grade Two Mathematics program, not all students will have a good grasp of this concept. If your student becomes confused at any time, go back to the base ten blocks to demonstrate what is happening.

Write the numbers one over the other. Be careful to line up the tens and ones.

Tens	Ones
3 + 4	6 6
7	12

You have 7 tens and 12 ones. You need to trade 10 ones for a ten. Then you will have 8 tens and 2 ones or 82.

To save time and prevent confusion, you can regroup the 12 ones as you add. Write the one ten in the tens column and the remaining 2 ones in the ones column. This is sometimes called carrying the ten.

Tens	Ones
1 3 + 4	6 6
8	2

12 ones is the same as 1 ten and 2 ones. So, I write the 1 in the tens column, and then I add 1+3+4. This equals 8.

Do the equations below. Add the ones first. If there are more than 10 in the ones column, remember to move the ten. Use the base ten blocks if you need to.

1.

Tens	Ones
2 5	8 8

2.

Tens	Ones
1 + 3	7 6

3.

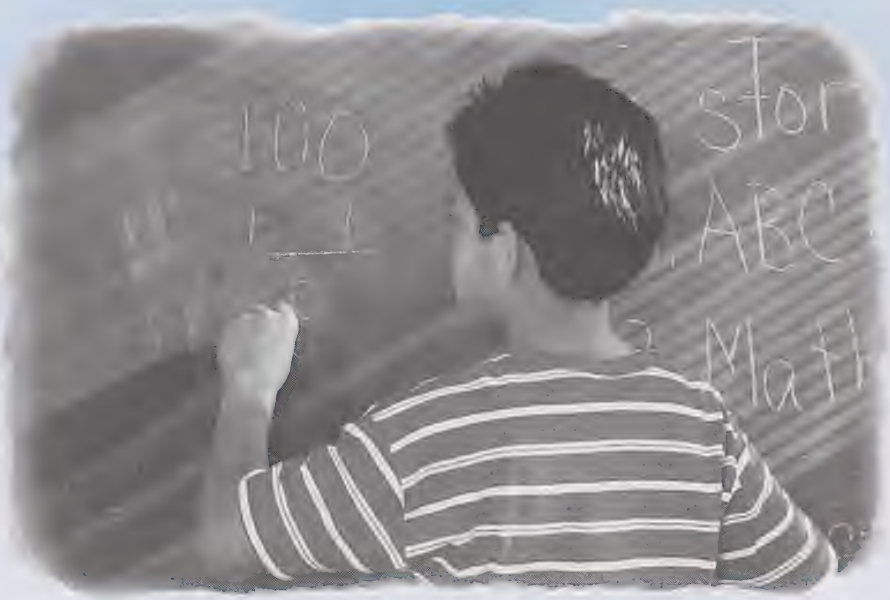
Tens	Ones
5 + 2	9 1

Go to Assignment Booklet 1B.

DAY 14: ANOTHER WAY TO ADD LARGE NUMBERS

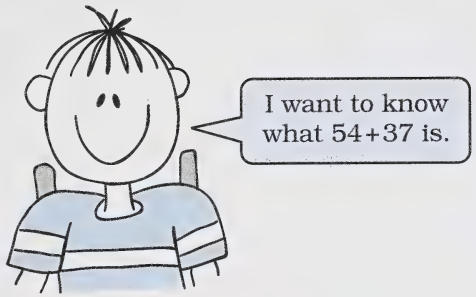
On Day 13, you learned how regrouping can help you add large numbers. Today's lesson will show you another way to add.

You will also do some mental math and practise addition facts.



LESSON 1

Some people find it confusing to regroup numbers, so they use a different method.



Some students have difficulty understanding the regrouping process. This method of addition does not require the student to regroup or carry numbers.

First Luke adds the tens: $50 + 30 = 80$

Then he adds the ones. $4 + 7 = 11$

Then he adds the tens to the ones. $80 + 11 = 91$

When you write it up and down, it looks like this:

$$\begin{array}{rrr} 54 & 50 & \\ +\ 37 & +\ 30 & \\ \hline 80 & \leftarrow 80 & 4 \\ & & +\ 7 \\ & & \hline +\ 11 & \leftarrow & 11 \\ \hline 91 & & \end{array}$$

DAY 14

1. Do the examples below by adding the tens, adding the ones, and then adding the tens and ones together.

a.

$$\begin{array}{r} 37 \\ +\ 62 \\ \hline \\ \\ + \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ +\ 60 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 2 \\ \hline \end{array}$$

b.

$$\begin{array}{r} 55 \\ +\ 16 \\ \hline \\ \\ + \\ \hline \end{array} \qquad \begin{array}{r} 50 \\ +\ 10 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 6 \\ \hline \end{array}$$

c.

$$\begin{array}{r} 56 \\ +\ 34 \\ \hline \\ \\ + \\ \hline \end{array} \qquad \begin{array}{r} 50 \\ +\ 30 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 4 \\ \hline \end{array}$$

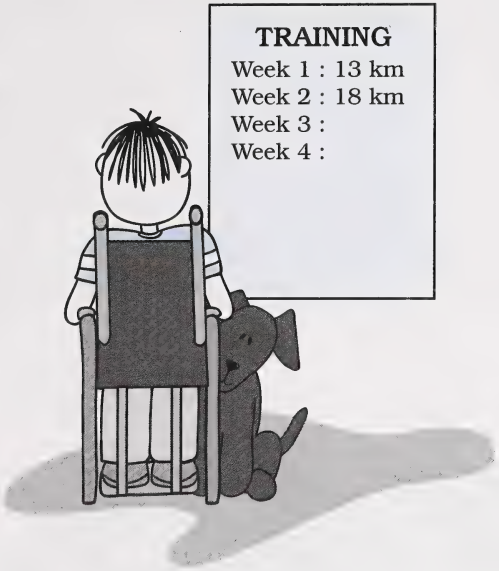
d.

$$\begin{array}{r} 18 \\ +\ 70 \\ \hline \\ \\ + \\ \hline \end{array} \qquad \begin{array}{r} 10 \\ +\ 70 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 0 \\ \hline \end{array}$$

As you practise, you may find that you can do these steps in your mind.

Solve the problem below, using your favourite addition method.

The student may choose to use regrouping or the method that has just been introduced.



Luke is training for his next wheelchair race. In the first week, he wheeled 13 kilometres. In the second week, he did 18 kilometres. How many kilometres has he gone in total?

Understand the problem.

2. What do you have to find out? _____

_____

Make a plan.

3. How will you solve the problem? _____

_____

Try the plan.

4. a. Write an equation and solve it. _____

b. Write your answer in a complete sentence. _____

_____

Look back.

5. Does your answer make sense? _____

LESSON 2

MENTAL MATH

Making tens can also help you add three or more numbers.

Look at this equation.

4 + 5 + 6 = _____

You know that you can add these numbers in any order to get the answer. Can you see a combination that would equal ten?

$4 + 6 = 10$

Now, it is easy to add the 5 in your head.

$10 + 5 = 15$

Look for a combination that equals 10 in each equation. Then add the other number. Try to do the questions that follow in your mind.

1. $5 + 7 + 5 =$ _____
2. $3 + 4 + 7 =$ _____
3. $8 + 2 + 9 =$ _____
4. $6 + 8 + 4 =$ _____
5. $7 + 3 + 7 =$ _____
6. $4 + 6 + 5 =$ _____

Are you ready for your timed exercise?

Ask your home instructor to time you for 2 minutes. Write how many you completed. Ask your home instructor to mark the questions and to write how many were correct.

Good luck!

TIMED EXERCISE: 2 MINUTES

2 + 9	9 + 7	5 + 3	6 + 5
9 + 4	6 + 6	5 + 7	7 + 9

5+5=_____	6+4=_____	7+8=_____	8+8=_____
7+6=_____	4+8=_____	6+3=_____	4+8=_____
9+6=_____	8+5=_____	9+9=_____	5+9=_____

Number completed	
Number correct	

EXTENSION ACTIVITY

For extra practice adding two-digit numbers, remove the "Addition Game Card" from the Cut-Out Learning Aids section in the Appendix.

This game may be played alone or with a partner. To play the game, close your eyes and flip a coin onto the game card. Write down the number in the section that the coin lands in. If it lands in two or more spaces, write down the number that most of the coin is in. Flip the coin again. Add the number your coin lands on to the first number.

If you are playing with a partner, get your partner to do the same. The person with the largest sum gets one point. The first one to earn 10 points is the winner.

26	43	39	21
18	25	36	45
51	20	42	33
29	16	41	26
13	44	37	15

CHALLENGE ACTIVITY

To make the game more challenging, the partners may keep a running total of the sums. The first one to earn 1000 wins.

Go to Assignment Booklet 1B.

DAY 15: SUBTRACTION WITH REGROUPING

Today, you will work with subtraction questions where you need to regroup the numbers. Do you remember how to regroup for subtraction?

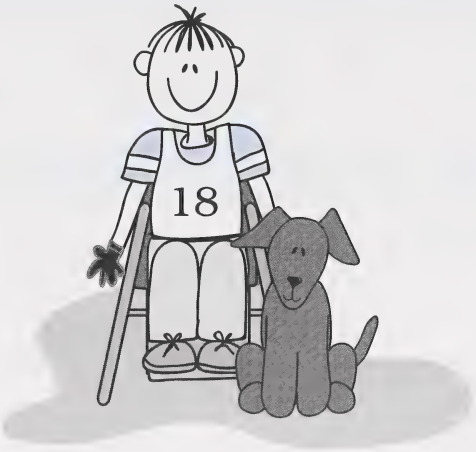
LESSON 1

When you are subtracting large numbers, regrouping the tens and ones can make it easier for you to find the answer.

Take out your base ten blocks and your place-value mat.

Work through this problem, using your base ten materials.

Luke wanted to do 70 kilometres of training the week before his big wheelchair race. After three days, he had wheeled 44 kilometres. How many more kilometres does he need to go to meet his goal?



The concept of regrouping was introduced in grade two, but many students do not have a good understanding of the process. To refresh your student's memory, use the base ten materials for the first few examples. Your student will be working with three-digit addition and subtraction later in the year, so it is important that this concept is mastered.

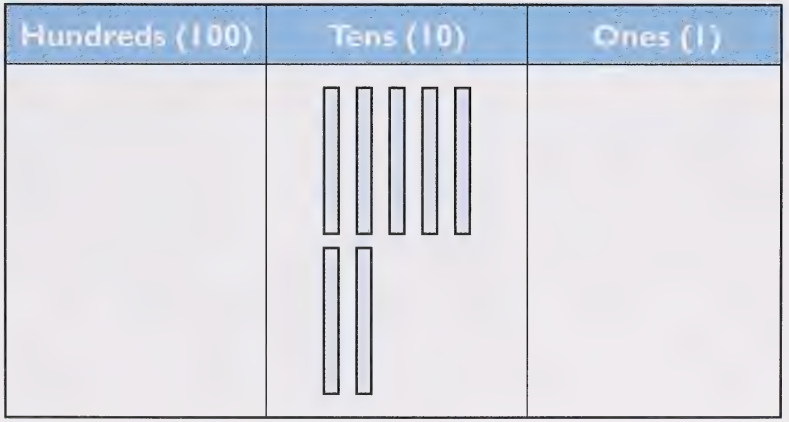
Luke knows he must subtract to find out how many more kilometres he needs to go.

His equation looks like this.

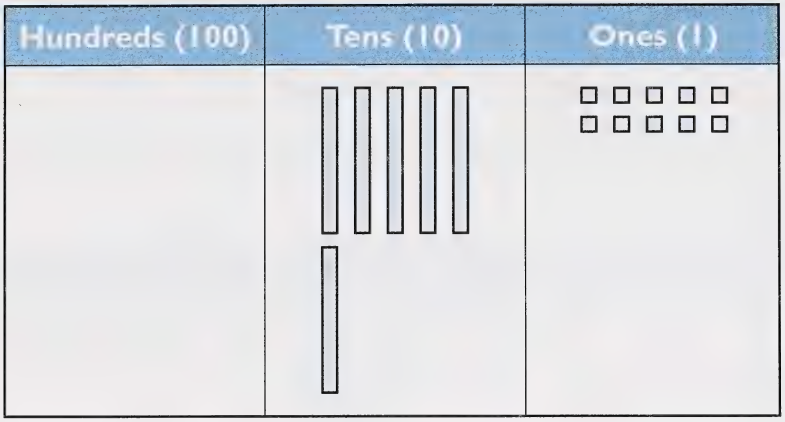
$$\begin{array}{r} 70 \\ -\ 44 \\ \hline \end{array}$$

When Luke looks at the ones place, he can see at a glance that he can't subtract 4 from 0. He decides to use his base ten blocks to help him.

Put 70 blocks (7 tens) on the place-value mat

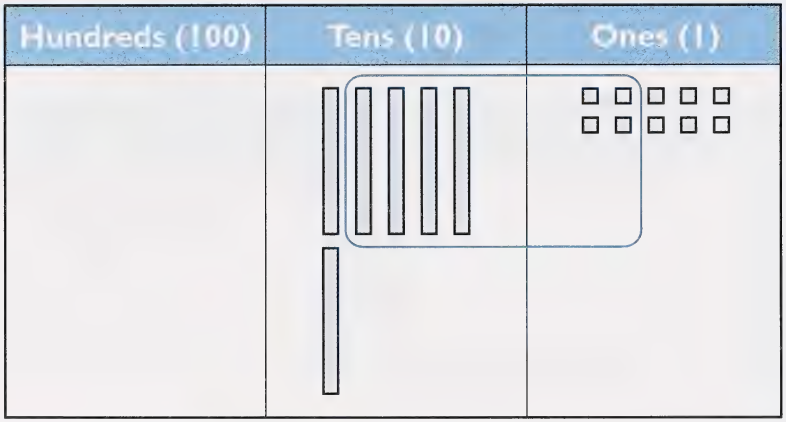


Luke will have to trade 1 ten for 10 ones.



1. Does Luke still have 70 blocks ? _____

Now Luke can take 44 away easily. Use your blocks to do that.



2. How many blocks do you have left? _____

3. Luke has to go _____ more kilometres to reach his goal.

Now try this equation using your base ten blocks and your place-value mat.

$$\begin{array}{r} 45 \\ -\ 27 \\ \hline \end{array}$$

Hundreds (100)	Tens (10)	Ones (1)
		

4. Can you subtract 7 from 5 ? _____

You will have to trade 1 ten for 10 ones.

Hundreds (100)	Tens (10)	Ones (1)
		

5. Can you subtract 7 from 15? _____

6. Now take away 27 blocks. How many blocks are left? _____

7.
$$\begin{array}{r} 45 \\ -\ 27 \\ \hline \end{array}$$

8. Use your base ten blocks and your place-value mat to do these questions. You may need to regroup tens to help you subtract.

a. $\begin{array}{r} 32 \\ -\ 16 \\ \hline \end{array}$ b. $\begin{array}{r} 86 \\ -\ 48 \\ \hline \end{array}$ c. $\begin{array}{r} 77 \\ -\ 34 \\ \hline \end{array}$ d. $\begin{array}{r} 53 \\ -\ 35 \\ \hline \end{array}$

Your student does not need to regroup in question 8.c. Watch as your student does the question and discuss what happens if the student does try to regroup when it isn't necessary.

LESSON 2

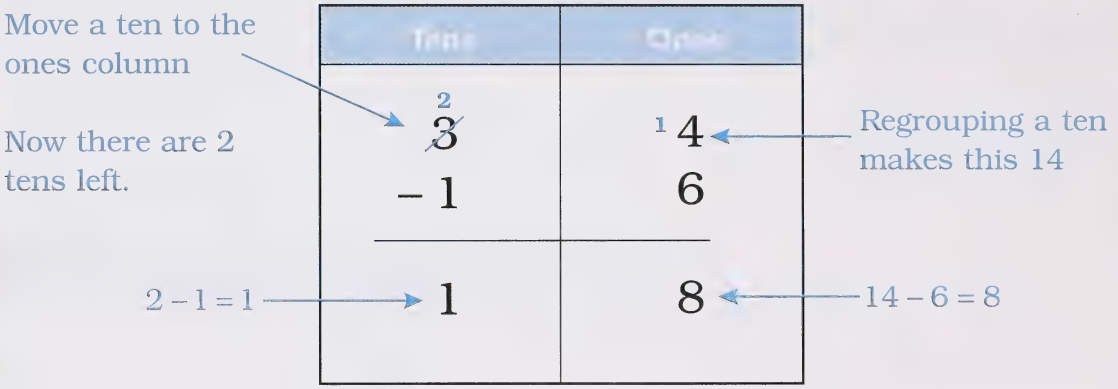
There is a short way to show regrouping. Look at the following question.

$$\begin{array}{r} 34 \\ -\ 16 \\ \hline \end{array}$$

Will you need to regroup? _____

This is the traditional method of showing two-digit subtraction. If your student has difficulty understanding the process, continue to use base ten blocks.

You can show the regrouping with pencil and paper like this:



This is sometimes called borrowing a ten.

If difficulties are experienced, the student may use the base ten blocks.

2. Think about whether it will be necessary to regroup before you do each question. Use the pencil and paper method to show regrouping.

a.

Tens	Ones
4 – 2	7 9

b.

Tens	Ones
7 – 4	1 5

c.

Tens	Ones
7 – 7	4 1

d.

Tens	Ones
4 – 3	5 6

For extra practice adding and subtracting large numbers try these websites.

- **http://www.aplusmath.com**

  At the A+ Math website, you can choose *Worksheets* to practise adding and subtracting large numbers.

- **http://www.aaamath.com**

  Choose addition or subtraction and then the category that you want to practise. There are also estimation and mental math activities at this site.

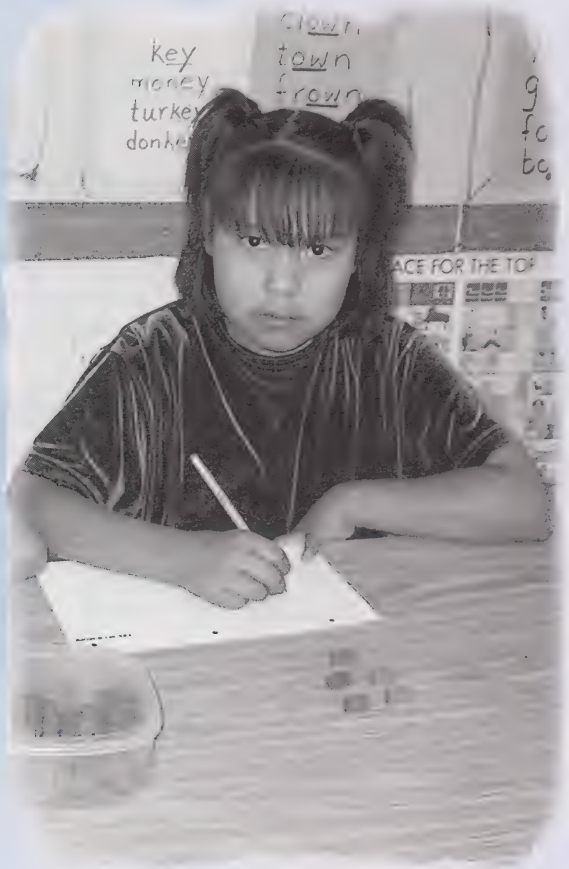
Go to Assignment Booklet 1B.

DAY 16: TAKE A GUESS

Did you know that guessing is an important math skill? Making a careful guess is called **estimating** in math. Estimating is often done mentally.

Estimating can help you in many ways. Some problems don't need an exact answer. An estimation will do. At other times, an estimation can be used to check whether an answer makes sense.

In today's lesson, you will use estimation to help you solve problems and check answers.



LESSON 1

Estimation is used often in measurement activities. You may be asked to estimate the length of an object or how much liquid is in a container. You also have to know how to estimate answers to math questions. Estimating an answer can help you check your work to see if your answer makes sense.

When you estimate, you usually change the numbers to make them easier to add or subtract in your mind. This is sometimes called **rounding** numbers. Rounding numbers to the nearest 10, 100, or 1000 makes them much easier to work with.

When you round numbers to the nearest 10, you think about whether the number in the ones place is more or less than 5. If it is 5 or more, you round ahead to the next ten. If it is less than 5, you round back to the previous ten.

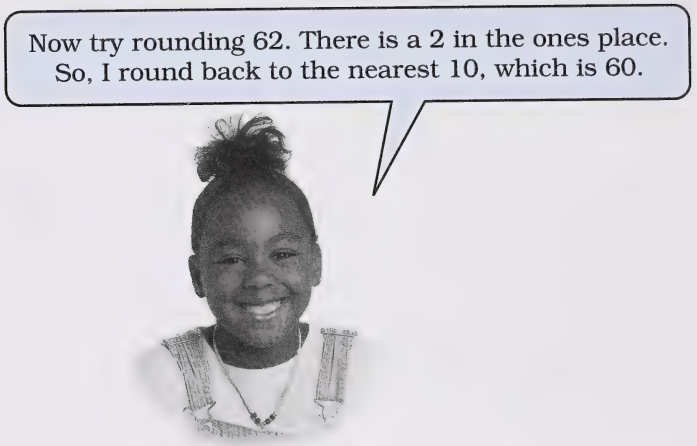
To round 47 to the nearest 10, look at the number in the ones place.

1. What number is in the ones place? _____

The 7 is greater than 5. So, round ahead to the nearest ten, which is 50.

Estimation is a very important skill. The student should be able to round numbers mentally and estimate sums and differences to check his or her work. The ability to judge whether an answer makes sense becomes increasingly important as students use calculators and computers.

In this lesson, the student works on rounding numbers to the nearest 10. In later modules, rounding to the nearest 100 will be discussed.



A hundred chart or number line, such as the one made in Day 2 may be helpful for students that have a difficult time rounding numbers. Post the chart or number line where the student can use it for estimation activities.

It may help you to think of the numbers written in order.

Numbers with less than 5 in the ones place are rounded back to the previous ten.

Numbers with 5 or more in the ones place are rounded ahead to the next ten.

60 61 62 63 64 65 66 67 68 69 70

Round these numbers to the nearest 10.

2. a. 54 _____ b. 78 _____ c. 91 _____

d. 23 _____ e. 57 _____ f. 82 _____

LESSON 2

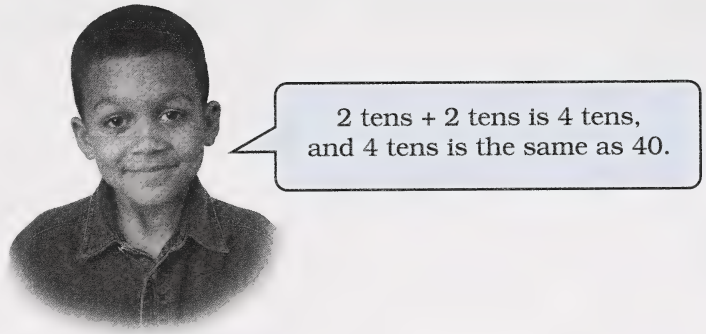
Adding tens is very easy. You can probably do these problems in your head.

1. a. 20 + 20 = _____

b. 30 + 50 = _____

c. 70 + 20 = _____

d. 40 + 50 = _____



You can round numbers in equations to make them easy to estimate.

Look at how the problem below can be estimated.

$$\begin{array}{rcl} 59 & \xrightarrow{\text{round to}} & 60 \\ +\ 22 & \xrightarrow{\text{round to}} & +\ 20 \\ \hline & & 80 \end{array} \quad \leftarrow \text{estimated sum}$$

Now go back and find the exact sum. Was 80 a close estimate? _____

2. Round each number of the equation to the nearest ten, and estimate the total. Then go back and find the exact sum.

a. 65 round to _____

+ 32 round to + _____

_____

← estimated sum

_____

b. 43 round to _____

+ 39 round to _____ + _____

← estimated sum

_____

3. You can estimate subtraction equations the same way. Round and estimate first. Then find the exact difference.

a. 75 round to _____

− 49 round to _____ − _____

← estimated difference

_____

b. 94 round to _____

− 26 round to _____ − _____

← estimated difference

_____

c. 38 → round to → _____

− 12 → round to → − _____

← estimated difference

_____

If your student has difficulty estimating mentally, written calculation may be used.

4. With practice, you will be able to round and estimate sums and differences in your mind. Try to estimate the answers mentally first, and then find the exact answer.

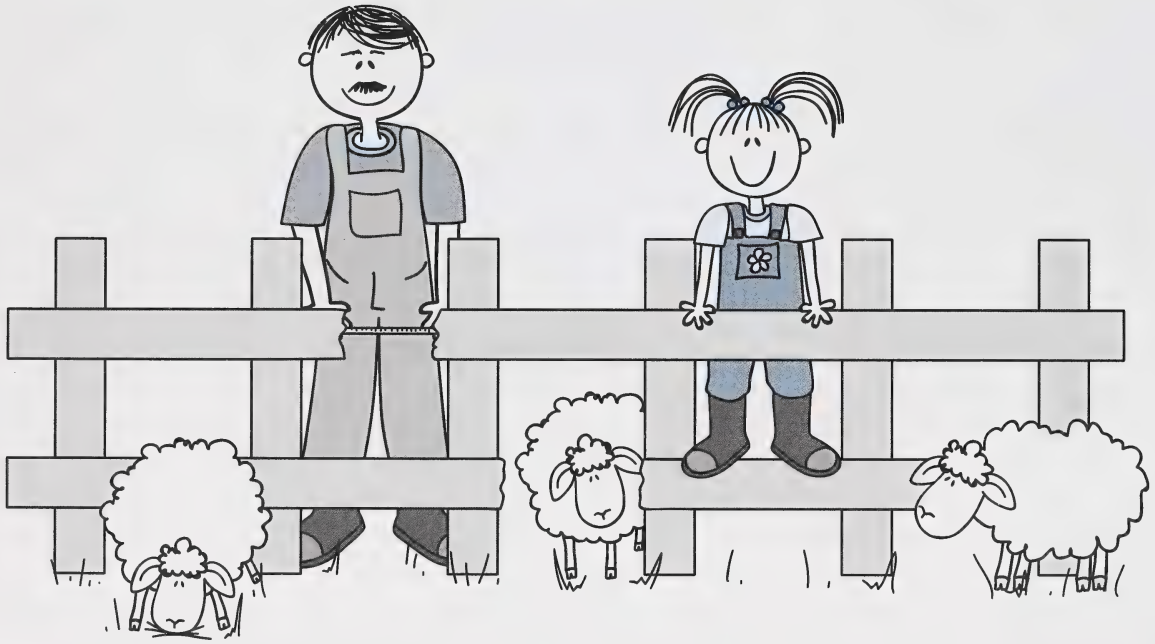
a. 61
+ 32 estimated answer: _____

b. 43
+ 28 estimated answer: _____

c. 79
− 68 estimated answer: _____

LESSON 3

Some problems in math or in real life do not need exact answers. Often a close estimate will answer the question. Use what you have learned about estimating sums to solve the problem below.



Sarah and her dad are fixing a corral fence. Her dad measured the spaces where boards were broken. He found one space was 36 cm and the other was 48 cm. Sarah went to the shop to get a board that would be long enough to patch both spaces. In the shop, there were two boards. One was 80 cm and the other was 90 cm. Which one should Sarah bring to her dad?

Understand the problem.

1. What do you have to find out? _____

_____

Make a plan.

2. a. How will you solve the problem? _____

b. Do you have to know an exact answer? _____

Try the plan.

3. Estimate the answer by rounding 36 cm and 48 cm. Then write the number sentence to show your work.

_____

4. Which board should Sarah take to her dad? Why? _____

_____

Look back.

5. Does your answer make sense? _____

Now go to Assignment Booklet 1B.

DAY 17: MAKING SURE

You have learned three ways of making sure you have the correct answer to a math question:

- using the opposite operation
- using a calculator
- using estimation

In today's lesson, you will practise using these strategies to check your answers to addition and subtraction questions.

If your student does not recall the two ways of verifying solutions, turn back to the lessons on Day 9 and review.

LESSON 1

Do you remember the two ways you learned to check your work on Day 9? Write them below.

1. _____

2. _____

These two ways of checking your work are used when you want to check an exact answer.

Estimation is a third way of making sure your work is correct. It is a quick way to check your work to see if your answer makes sense. It does not give you an exact answer, just a close guess.

Take out your calculator.

3. When would you use a calculator to check your work?

_____

_____

When you use your calculator, remember to push each key carefully. When you add, push + after each number and = to get the total.

Use your calculator to check the answers. Put a check mark (✓) beside the answers that are correct. Put an ex (✗) and the right answer beside the sums that are incorrect.

4. a.
$$\begin{array}{r} 17 \\ 21 \\ 19 \\ +\,34 \\ \hline 90 \end{array}$$

b.
$$\begin{array}{r} 32 \\ 9 \\ 25 \\ +\,18 \\ \hline 84 \end{array}$$

c.
$$\begin{array}{r} 29 \\ 17 \\ 12 \\ +\,41 \\ \hline 102 \end{array}$$

LESSON 2

You learned how to use the opposite operation to check your answer.

To find out if $9 + 8 = 17$, you can subtract.

17–8=9. The answer is correct.

This works for subtraction too. To find out if $18 - 9 = 9$, you add $9 + 9$. If the answer is the same as the first number in the subtraction equation, it is correct.

You can use this method to make sure your answer is correct when you are adding or subtracting large numbers too.

The student follows the same process as working with smaller numbers. The addend is subtracted from the sum to get the other addend.

For example,

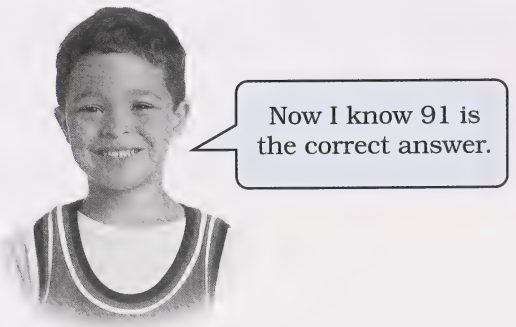
$$\begin{array}{r} \mathbf{54} \\ +\ 37 \\ \hline 91 \end{array}$$

Write the total. → 91

Subtract the addend. → $-\ 37$

$\mathbf{54}$

The number is the same as the first number in the original equation. So, the answer is correct.



Check these addition problems by subracting.

1. a. **67** + 23 = 80

80 − 23 =

Is your answer the same as the bolded number? _____

Is the answer to the addition question correct? _____

b. **25** + 37 = 62

62 − 37 =

Is your answer the same as the bolded number? _____

Is the answer to the addition question correct? _____

c. **63** + 29 = 82

82 − 29 =

Is your answer the same as the bolded number? _____

Is the answer to the addition question correct? _____

d. **72** + 19 = 91

91 − 19 =

Is your answer the same as the bolded number? _____

Is the answer to the addition question correct? _____

To check subtraction problems, you add the last two numbers of the equation.

$$\begin{array}{r} \mathbf{58} \\ -\ 32 \\ \hline 26 \end{array} \qquad \begin{array}{r} 26 \\ +\ 32 \\ \hline \mathbf{58} \end{array}$$

When you add these two numbers, you should get the first number in the original equation.

Yes, 26 is the correct answer.

2. Add to check the answers to the subtraction questions.

a. $\begin{array}{r} \mathbf{63} \\ -\ 15 \\ \hline 58 \end{array}$ $\begin{array}{r} 58 \\ +\ 15 \\ \hline \end{array}$

Is your answer the same as the bolded number? _____

Is the answer to the subtraction question correct? _____

b. $\begin{array}{r} \mathbf{39} \\ -\ 27 \\ \hline 11 \end{array}$ $\begin{array}{r} 11 \\ +\ 27 \\ \hline \end{array}$

Is your answer the same as the bolded number? _____

Is the answer to the subtraction question correct? _____

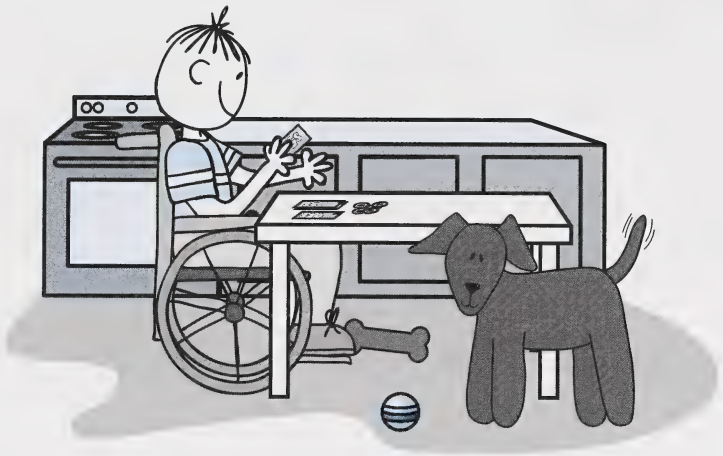
c. $\begin{array}{r} \mathbf{91} \\ -\ 36 \\ \hline 55 \end{array}$ $\begin{array}{r} 55 \\ +\ 36 \\ \hline \end{array}$

Is your answer the same as the bolded number? _____

Is the answer to the subtraction question correct? _____

LESSON 3

Estimating is a quick way to help you decide whether the answer makes sense or not. If your answer is close to the estimate, it is probably correct. If your estimate is not close to the answer, you may want to check it with a calculator or with the opposite operation. It is a good idea to do an estimate when you do step 4 in problem solving.



Luke was selling chocolate bars for his sports club. He sold 43 chocolate bars on the first night and 37 chocolate bars on the second night. Each chocolate bar was worth $1. When he counted his money, he had $70. Did he have the right amount?

Understand the problem.

1. What do you have to find out? _____

_____

Make a plan.

2. How will you solve the problem? _____

_____

Try the plan.

3. Write an equation, and solve it. _____

Look back.

4. a. Check the answer by rounding 43 and 37. Show your work.

_____

b. Does Luke have the right amount of money for the tickets? Explain how you know.

_____

_____

Go to Assignment Booklet 1B.

DAY 18: LOOKING BACK

Today, you will review the different strategies you learned for addition and subtraction. Like Sarah and Luke, you solved problems using the math operations of adding and subtracting. It's time to show your teacher what you have learned by completing some review questions in your Assignment Booklet. You may want to look back through your Student Module Booklet if you have difficulty with any of the questions.

Go to Assignment Booklet 1B. When you have completed the assignments for Day 18, read Luke's card to Sarah to recall all you have learned. Then complete the Student Checklist for this module.

SUMMARY

Luke and Sarah like to write to each other about what they have been doing. They both enjoy mathematics and like to tell each other what they have learned. Luke wrote to Sarah first.

Hi Sarah,

I have been practising for the Special Olympics in wheelchair racing and I'm getting faster. In Module 1 of the Grade Three Mathematics course, I have reviewed some things from grade two and learned some new things too. I learned

- quick strategies for adding and subtracting small numbers
- 4 helpful steps to solve problems
- how to check addition and subtraction
- new ways to add and subtract larger numbers

Your cousin,
Luke

P.S. I can use the things I've learned to keep track of my racing and other activities. What have you been doing?

APPENDIX

GLOSSARY
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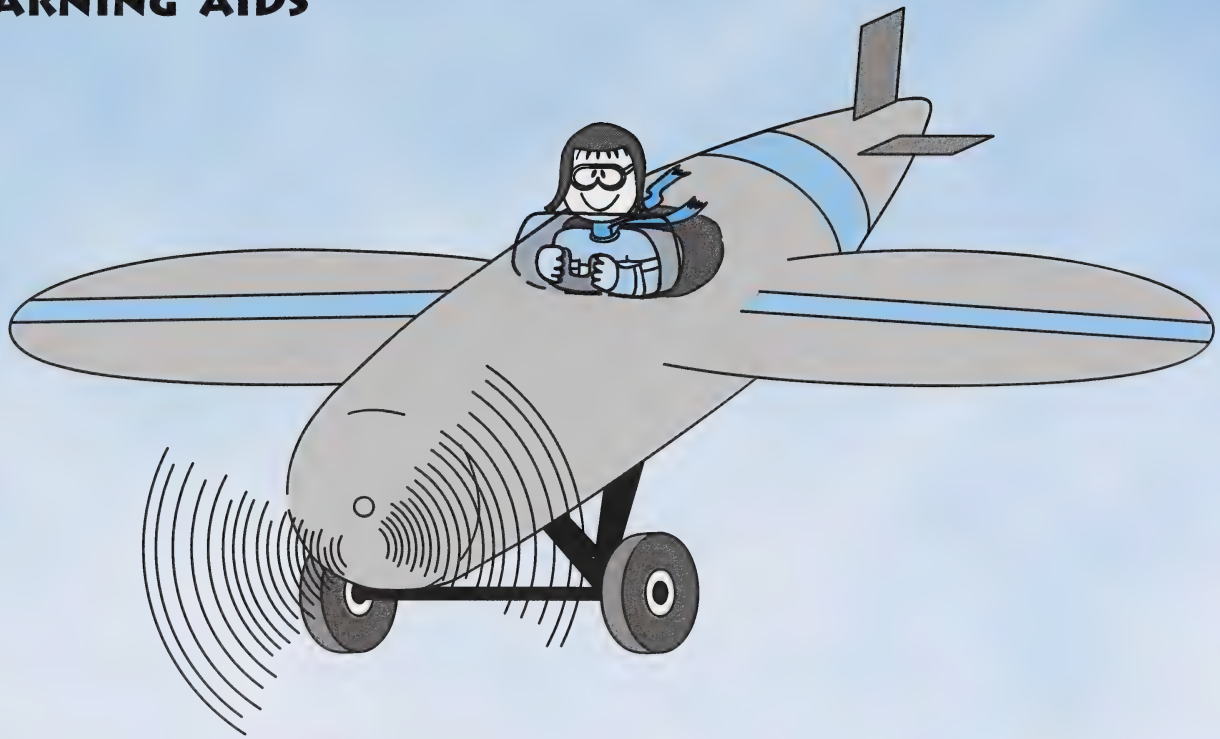
CUT-OUT LEARNING AIDS



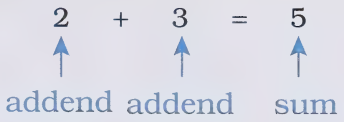
GLOSSARY

The following words are defined in a mathematical context as used within this module. You may find these definitions helpful when explaining concepts to your student.

addition: the joining or combining of two or more groups

addend: any number that is added to another number to obtain a sum

Example:



counting on: the practice of starting from a number and counting forward

Example: To solve 26 + 3 = _____, the student says 26, and counts on 27, 28, 29

difference: the number left after subtracting one number from another

equation: a number sentence consiting of numbers and symbols (+, −) used to show a mathematical operation

Example: 52 + 36 = 88

estimating: making a close guess or arriving at an answer in round numbers

fact family: numbers of related facts, also referred to as a number family

Example: 5 + 6 = 11, 6 + 5 = 11, 11 − 6 = 5, 11 − 5 = 6 are numbers of a fact family.

inverse: opposite

Addition and subtraction are inverse operations.

numerals: the symbol that stands for a number

Example: 1, 2, 3, . . . are numerals for the number concept.

operation: a mathematical process or action

Addition and subtraction are mathematics operations.

recall: remember instantly

regrouping: renaming or representing numbers using place value for the purpose of doing a mathematical operation

Example: 67, or 6 tens and 7 ones, can be regrouped as 5 tens and 17 ones. It is sometimes called carrying and borrowing.

rounding: bringing a number to the next nearest unit

You can round numbers to the nearest 10 or 100, such as 53 to 50 or 274 to 300.

subtraction: taking one number from another number to find the difference

sum: the number that results from adding two or more numbers together

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NUMBER CARDS TO 20

Cut out each number card.

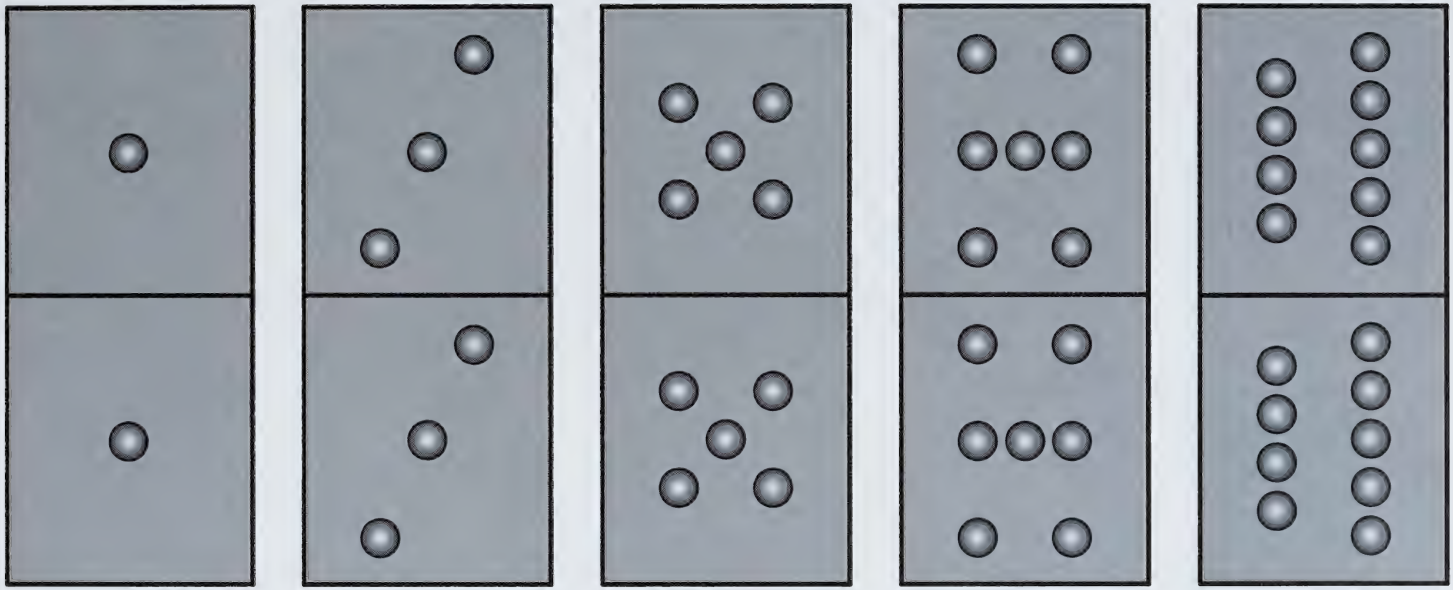
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

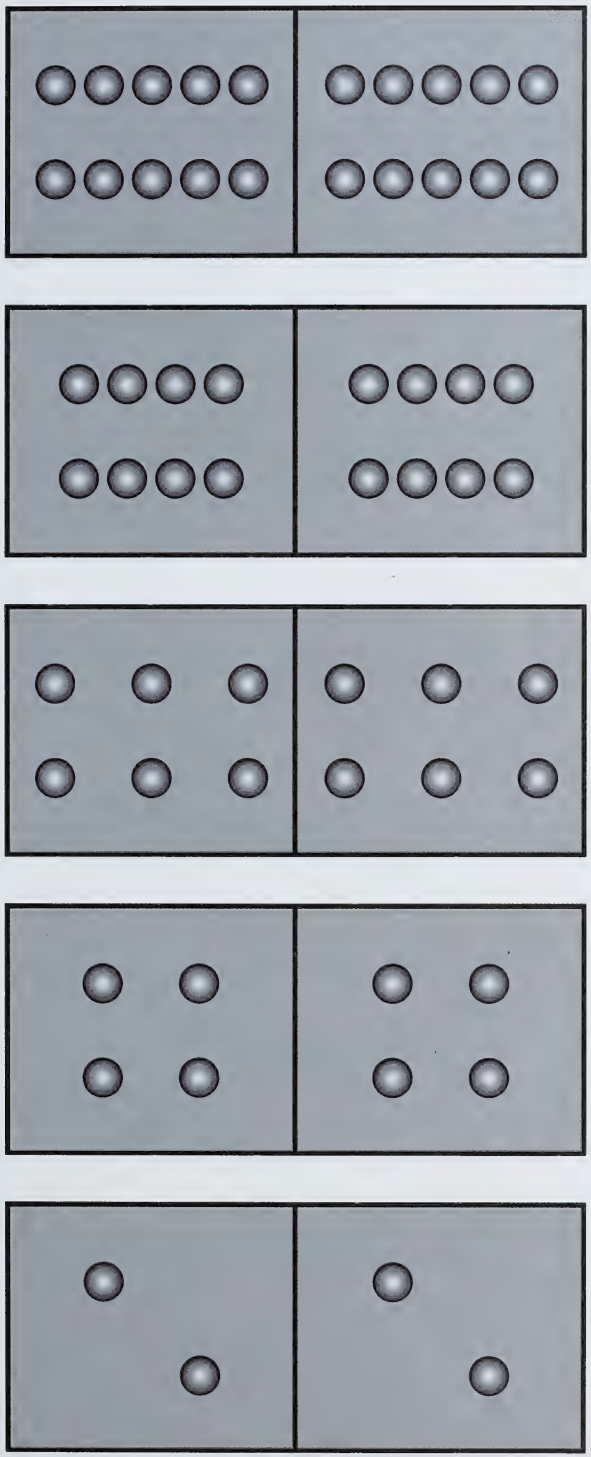
TENS FRAME

Cut on the outside of the frame.

DOMINO DOUBLES

Cut out each domino.

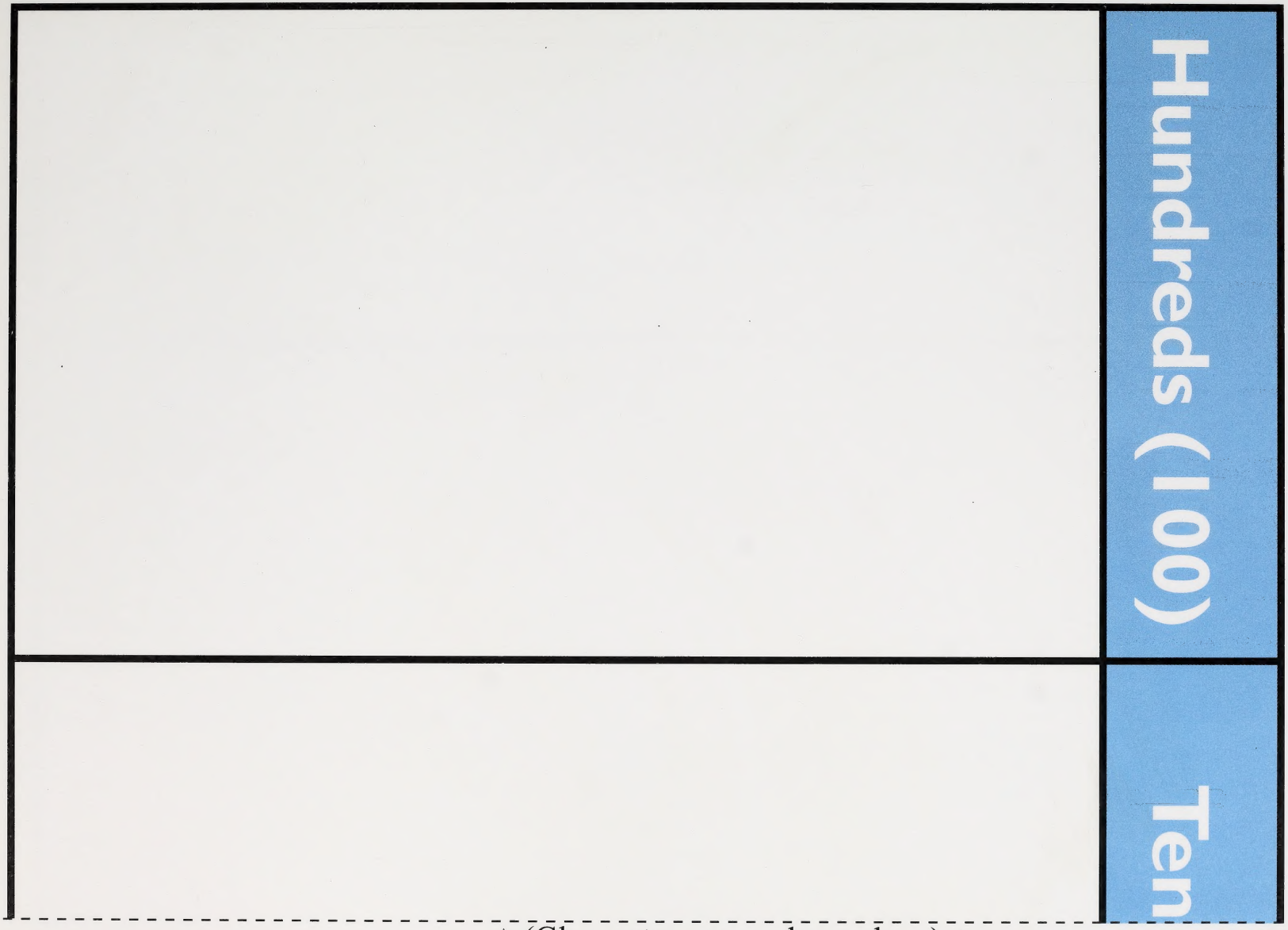




ADDITION GAME CARD

26	43	39	21
18	25	36	45
51	20	42	33
29	16	41	26
13	44	37	15

PLACE VALUE MAT (Cut off this strip.)



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s (10)	Ones (1)

(Cut off this strip.)